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COMPUTERWORLD

INSIDE

Product Spotlight — Still no need for crowd control in OS/2 application development. Page 77.

Outsourcing: The great debate. Two executives go head-to-head over the merits of the latest IS management trend. Page 69.

Sit down and take Notes! Lotus unwraps its pricey productivity applications program for distributed networks. Page 7.

Some ISDN users won't wait for standards to crystallize; they believe that getting a jump on implementation will pay off. Page 4.

Sun takes a run at DEC and other minicomputer vendors with a powered-up server. Page 8. DEC, meanwhile, fills in some of its imaging strategy with products and alliances. Page 10.

All in the family: HP sets out its strategy for meeting the needs of Apollo Prism users and introduces a pumped-up RISC chip that high-end minicomputer users say is badly needed. Stories, page 129.

Portable Mac earns high rankings in most categories. Product review, page 45.

BART software contractor pulls out after transit board fails to respond to offer to resolve dispute. Page 128.

IBM's pain seen as users' gain

BY ROBERT MORAN
CW STAFF

NEW YORK — IBM's cost-cutting actions last week, which were seen as a reaction to stiff competition and discounting for hardware sales, are not likely to stem cutthroat discounting anytime soon, customers predicted.

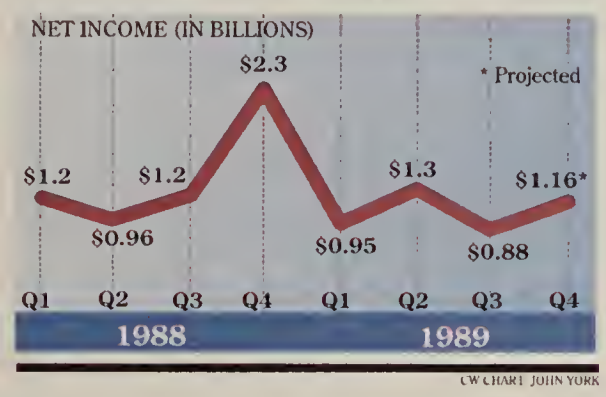
In response to stiffening competition, pricing pressures and shorter product life cycles in the sluggish mainframe market, IBM made a series of short- and long-term organizational changes that at least partially answer longstanding Wall Street demands to cut expenses.

In a prepared statement, IBM Chairman John Akers indicated that the company has not ruled out similar actions in the future. "We intend to continue to drive productivity, and we are fully prepared to take further actions if dictated by economic or business conditions," Akers said.

The company eliminated about $1 billion in annual costs and expenses and booked an estimated charge before taxes of $2.3 billion against fourth-quarter 1989 earnings. That figure includes $500 million for the cost of cutting 10,000 jobs in the U.S. through attrition and voluntary separations; the balance consists of anticipated expenses for plant

Continued on page 6

Seasonal Blues
IBM's $2 billion fourth-quarter charge is expected to eliminate its traditional final-quarter profit surge



CW CHART: JOHN YORK

U.S. missing 4M-bit boat

BY JAMES DALY
and RICHARD PASTORE
CW STAFF

The U.S. semiconductor industry is currently caught in a lopsided and potentially damaging balancing act. It is struggling to counter a flood of older 1M-bit dynamic random-access memory chips while coping with its inability to produce the higher capacity 4M-bit chips that are crucial for the next generation of computer hardware.

Only a handful of vendors are interested in U.S. Memories, Inc., the struggling memory chip consortium. This lack of interest makes industry analysts fear that U.S. manufacturers may be strolling myopically into a situation that Yogi Berra once described as deja vu all over again.

"The supply and demand situation is way out of whack," said Jerry Worchel, a senior analyst at In-Stat, Inc., a research firm in

Continued on page 14

Business foots hackers' bill

BY MICHAEL ALEXANDER
CW STAFF

They are called "high-tech street gangs" by one law enforcement official, and they use corporate voice-mail computer systems and private branch exchanges to carry out their crimes to the tune of perhaps $5 billion a year, often with impunity.

The victims rarely acknowledge their losses publicly and cooperate in prosecuting the offenders even less often. Law enforcement officials say they can investigate only a fraction of the cases; those that make it to court, they say, often fall victim to unsympathetic judges and juries.

Is it any wonder that telephone "phreaks" — i.e., computer hackers who specialize in ripping off telephone service and

Continued on page 128

Few expect industry aftershock

ANALYSIS

BY NELL MARGOLIS
CW STAFF

As the dust settled after IBM's bombshell last week, industry observers focusing on what the announcement portends for the computer industry at large generally found more reasons for hope than fear.

Analysts overwhelmingly said IBM's problems are exactly that: IBM's problems. "I don't think [last week's announcement] means anything to the rest of the industry," said Michael Geran at Nikko Securities Co. International. Even when seen as an IBM-contained event, Geran said, "this is just the latest in a series of evolutionary, cost-cutting steps. You don't get revolutionary steps from IBM."

In fact, said S. G. Warburg & Co. analyst David Wu, that could be the crux of IBM's blues.

"I'm absolutely floored by their reluctance to face up to the fact that to improve profits, they

Continued on page 6

IS STRATEGIES: FLORIDA POWER & LIGHT

Where quality takes command

BY ALAN J. RYAN
CW STAFF

If it isn't broken, fix it anyway.

That is the mandate at Florida Power & Light Co., the nation's fourth largest investor-owned utility, which services more than three million customers in a territory that includes four of the 10 fastest growing metropolitan areas in the country. From the top down, workers strive to continually improve the Miami-based electric utility's services by collecting data on everything from response time during a power outage to response time of the payroll processing software.

FPL's Quality Improvement Program is not just hype dreamed up by the marketing department and followed by few workers, however. At the nation's fastest growing utility — located in a state whose population has grown an explosive 31% since 1980 — QIP involves every one of FPL's 15,000 workers. The program's backbone is information and the technology that is used to collect and deliver it.

Continued on page 95

Donald Borgschulte
Director of systems and programming

"Quality improvement is never finished. It won't change as rapidly as it has over the last five years, but it won't stop."

NEWSPAPER

IN THIS ISSUE

NEWS

4 Daring firms bet some of their budgets on ISDN nearing viability.

4 Control Data casts Perlman in a new setting — as CEO.

6 Industry watchers hum along to the tune of the IBM blues.

7 After five years, Lotus finally makes a Notes of it.

8 Sun rises over midrange for the first time with a pair of Sparcservers.

8 Social Security Administration stuck with software changes stemming from Catastrophic Coverage Act repeal.

10 DEC needs to reflect clearer image strategy.

12 No moves on the board as U.S./Japan supercomputer stalemate continues.

128 Phreaking havoc: Hackers illegally using PBX systems can cause calamity when the bill arrives.

129 HP is finally more precise about the shape of Apollo products to come.

129 Hewlett-Packard pumps more power into RISC chip.

Quotable

"I hope people aren't that shortsighted that they'll allow U.S. Memories to become just that — a memory."

JERRY WORCHEL
IN-STAT

On the lack of vendor interest in the domestic DRAM consortium. See story page 1.

SYSTEMS & SOFTWARE

25 CICS OS/2 announcement knits up the raveled sleeve of SAA.

29 University of the Pacific toys with Blue blood but goes back to Unisys roots.

PCs & WORKSTATIONS

43 IBM's Current touted as real live wire for the personal information manager market.

NETWORKING

57 Racal adds another building block to its networking castle.

MANAGER'S JOURNAL

69 Outsourcing: Is it giving pocketbooks a transfusion or draining a company's lifeblood?

COMPUTER INDUSTRY

105 A Goliath of the industry enters battle wearing David's shoes.

PRODUCT SPOTLIGHT

77 It's still a mostly character-based world for OS/2 users.

IN DEPTH

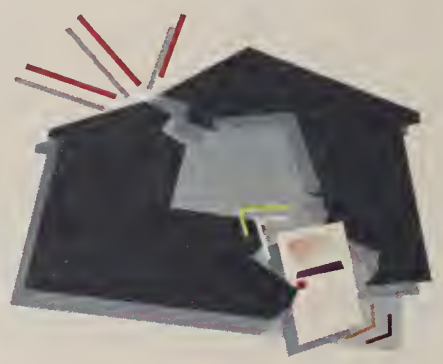
95 A look inside an IS group that helped a Florida utility gain international praise for quality and customer service. By Alan Ryan, Ellis Booker and Carol Hildebrand.

DEPARTMENTS

8 News Shorts
22 Editorial
74 Calendar
76 Book Review
112 Computer Careers
120 Marketplace
126 Training
127 Stocks
130 Trends

UPDATE

Wipe that smile off your face! If you think charm and charisma will get you a good performance review, think again. In a nationwide executive survey by Accountemps, two-thirds of the respondents listed "specific accomplishments" as the greatest influencer in performance reviews. Half of those sampled listed "general work habits and performance" as the keys to job success. Meanwhile "personality" scored pitifully low on the survey, as did "comments from co-workers." So, we've assembled the following universal job description: Wanted — Button-lipped worker bees, hold the brownnosing.



Sending processing out of the house: cost-saver or costly error? Page 69.

Applications for OS/2 are starting to emerge, but the picture is still far from complete. Page 77.

EXECUTIVE BRIEFING

■ **IBM customers expect** its widespread discounting to continue despite last week's announcement of a 10,000-employee reduction and $2.3 billion write-off. Aggressive competition from Amdahl and Hitachi Data Systems will keep this the season for mainframe bargain-hunting. IBM's moves probably do not portend a wave of similar cutbacks at competitors. **Page 1.**

■ **Information has been the fuel** for dramatic service quality improvements at Florida Power & Light Co. The fast-growing utility uses systems to track hundreds of quantifiable quality indicators, and managers then act on the data. The quality of IS itself is also measured by numbers such as application defects and Help desk response times. The information-intensive approach to quality made FPL the first U.S. company to win Japan's prestigious Deming Prize for quality. **Story begins on page 1.**

■ **Emotions run high on the volatile issue** of outsourcing, and two IS executives offer opposing views on one of 1989's hottest topics. **Page 69.** For better or worse, outsourcing has rekindled interest in careers at companies that provide the services. When an IS manager moves to this type of organization, he can work at his employer's primary activity rather than a support function. **Page 112.**

■ **The "high-tech street gangs"** known as "phreaks" are pirating corporate voice mail and long-distance services worth an estimated $5 billion per year. Even worse, law enforcement officials believe much of the telephone theft is being used for international drug dealing and other serious crimes. The break-ins typically occur in the PBX system, where call tracing is difficult, and victims usually do not know they've been hit until the bill arrives at the end of the month. **Pages 1, 128.**

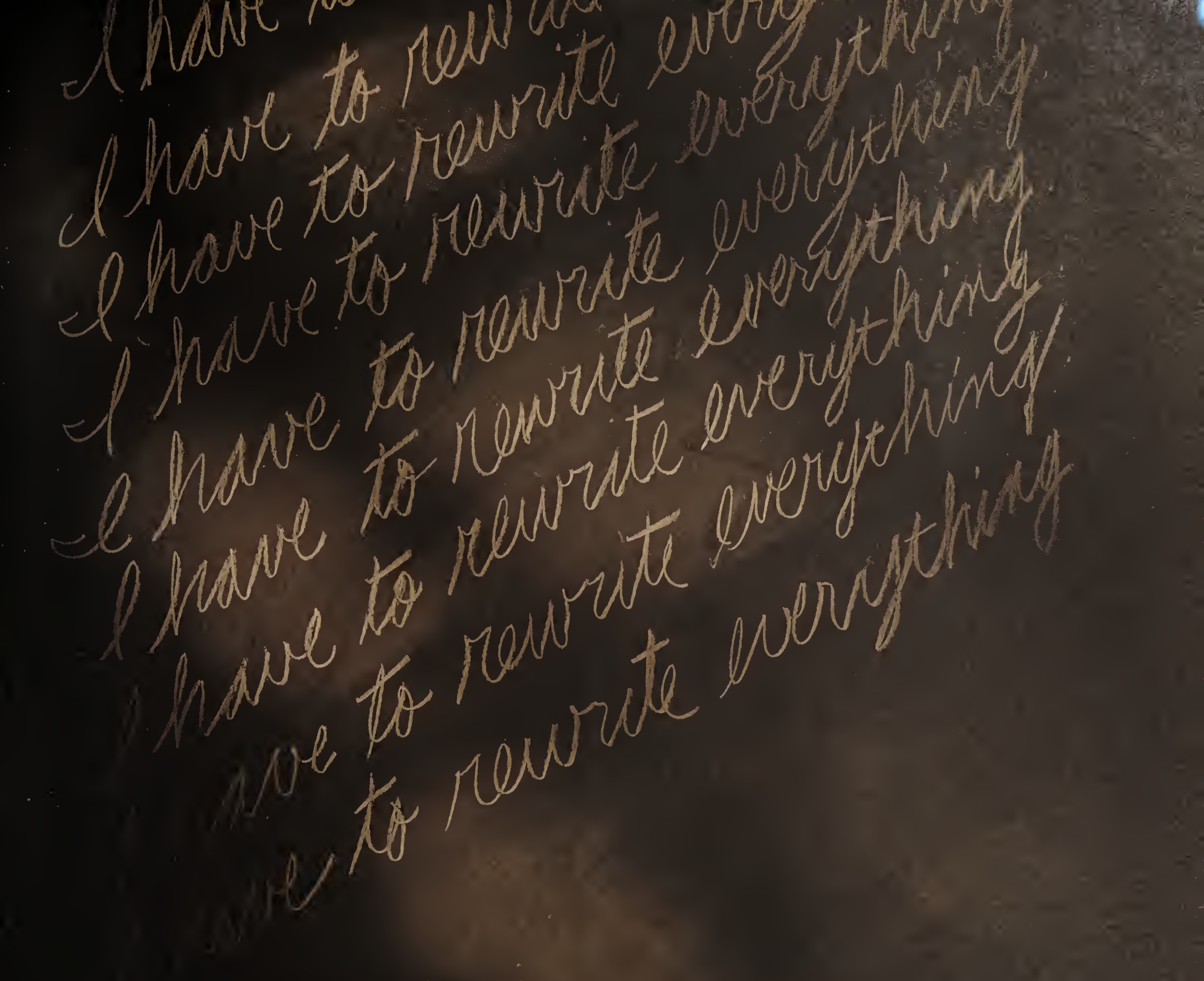
■ **Despite the lack** of available ISDN services and standards, firms in several different industries are forging ahead with ISDN business applications. However, users such as Hardee's Food Systems, Westinghouse and Porsche Cars are still frustrated by ISDN's unrealized potential. **Page 4.** ISDN-based videoconferencing continues to make strides with the aid of portable coder/decoder technology that helps eliminate the need for costly videoconferencing rooms. **Page 57.**

■ **Ross Perot takes the gloves off** as his noncompetitive clause with Electronic Data Systems expires. Observers say Perot Systems, regardless of its fiery founder, still faces long odds competing against the much larger EDS in systems integration. **Page 105.**

■ **The Bay Area Rapid Transit** software fiasco continues as vendor Logica Data Architects abandons the project. Logica walked when BART balked at paying an additional $1.1 million to complete the over-budget system upgrade. **Page 128.**

■ **On-site this week:** University of the Pacific IS Director Jerry Springer did not get fired for buying Unisys over IBM; in fact, he plans to save $1 million over five years. A former Burroughs shop, the university converted to an IBM 4381 in 1986 but will migrate back to Unisys for high-powered mainframe processing early next year. **Page 29.** The National Oceanographic and Atmospheric Administration's Great Lakes laboratory in Michigan also converted — from a DEC VAX 11/780 to an Intel Corp. 80386-based personal computer — for more accurate measurement and graphing of the potentially catastrophic Greenhouse Effect. **Page 43.**

■ **Potential still outstrips reality** when it comes to applications software for OS/2. The need for guesswork can be particularly frustrating for users interested in installing OS/2 local-area networks to handle mission-critical applications. **Page 77.**



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Some can't wait for ISDN to gel

With local services and standards on the '90 horizon, a few plan ahead

BY ELISABETH HORWITT
CW STAFF

ORLANDO, Fla. — While the majority of U.S. businesses are playing a waiting game with ISDN, several intrepid firms are betting part of their communications budgets on the standard's near-term viability.

At a conference organized by Northern Telecom, Inc., managers last week described how their companies plan to use Integrated Services Digital Network (ISDN) to support various applications across the country or the world that are difficult or impossible to implement now, given the limitations of today's ISDN networks.

One limitation, the lack of local ISDN services, should disappear in 1990. Northern Telecom has "been told point-blank" that all the former Bell operating companies (BOCs) will have filed ISDN tariffs by next year, said Stephen Jones, the vendor's manager of ISDN services.

An equally serious ISDN stumbling block has been the lack of a firm, complete standard. Specifications for connecting user equipment to carriers' ISDN services should be issued by the end of next year, Jones said. However, it will take vendors and standards bodies until the end of 1991 to come up with the "full features" that ensure interoperability between different types of user and carrier equipment, he added.

Some companies are not waiting for ISDN breakthroughs to happen. Instead, they are finding applications for the current version of the standard while gearing up to take advantage of full-function ISDN when it arrives.

One such firm is Hardee's Food Systems, Inc. The national fast-food chain has adopted ISDN as the means of connecting its Rocky Mount, N.C., headquarters complex, including a local restaurant that is acting as guinea pig for ISDN applications that Hardee's hopes to eventually provide to its outlets.

With a point-of-sale application, outlets can send information such as number and type of products sold, waste and inventory levels. Right now, "we get yesterday's statistics today, but marketing wants faster data," said Lynn Smith, Hardee's telecommunications director.

Hardee's also wants outlets to send back freeze-frame shots of customers, instead of relying on commercial study groups "to see who is buying," he added.

ISDN could make these applications possible by providing cost-effective connections at speeds of 64K bit/sec. and eventually megabits per second, Smith said.

However, in order to deploy ISDN across Hardee's 3,500 outlets, Hardee's must "get these guys [vendors] off their duffs" in terms of providing end-to-end ISDN connections throughout the U.S., Smith said.

While Hardee's is pushing vendors to make ISDN more viable, Westinghouse Electric Corp. is finding ways to make do with the current version. The company's Communications Systems Division plans in February or March to begin deploying ISDN Primary Rate Interface (PRI) lines on Northern Telecom DMS 250 switches.

By basing its ISDN network on one brand of ISDN switch, Westinghouse can ensure the delivery of ISDN services throughout the corporation. And since the BOCs still do not provide those last-mile ISDN connections, Westinghouse circumvents them via private T1 links, said communications systems director Thomas J. O'Toole.

ISDN links will fulfill several roles at Westinghouse, including faster delivery of engineering drawing revisions, which now travel via overnight mail. ISDN will also provide cost-effective videoconferencing for sites that have had to make do with freeze-frame, O'Toole said.

Still, the company remains "at the mercy" of vendors when it comes to deploying certain applications, O'Toole admitted. For example, the manufacturer will have to use X.25 or proprietary bridges to interconnect about 30 local-area networks, until LAN companies decide to support the standard.

Porsche Cars North America, Inc. is already getting what it considers good value for an ISDN connection between IBM Application System/400 hosts and user terminals at remote sites, according to Steve Backe, Porsche's manager of computer operations and telecommunications.

An ISDN PRI circuit costs only about $50 per month more than the former AT&T Dataphone Digital Service circuit and supports an additional 22 64K bit/sec. channels, which are being used to support additional remote terminal connections, as well as voice, Backe said.

Porsche would like to use AT&T's ISDN-based automatic number identification service to access a host and bring up key data for agents who respond to queries from car dealers, Backe said. However, the auto company must wait until the service comes to Reno, Nev., where the company is headquartered, he added. Porsche may also have to wait until its Northern Telecom SL-1 can talk to an AT&T central office switch.

SOME COMPANIES ARE not waiting for ISDN breakthroughs to happen. Instead, they are finding applications for the current version of the standard while gearing up to take advantage of full-function ISDN when it arrives.

Near-term boom

The market for ISDN terminals is projected to grow rapidly through 1994

Terminals	Value of shipment (in millions) '89	'91	'94	Average annual growth 1994-1999
Voice-only	6	44	273	115%
Data-only	8	65	445	123%
Voice/data	20	169	1119	124%
Image	0	15	382	–
Total	34	293	2219	131%

SOURCE: IGI CONSULTING, INC. CW CHART: JOHN YORK

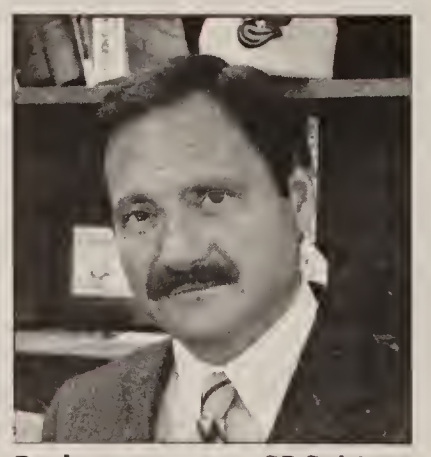
CDC ends search, turns to Perlman

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — In a move that surprised no one, Control Data Corp. President Lawrence Perlman was made chief executive officer last week.

Perlman, 51, will take over full leadership of the company's day-to-day and strategic direction on Jan. 1, leaving CDC Chairman Robert M. Price to focus on broader industry issues such as U.S. competitiveness and technology, CDC said in a statement.

Perlman was named president and chief operating officer last December. Prior to that, he was president of CDC's Imprimis Technology, Inc. disk drive operation, which CDC sold at the end of September to Seagate Technology, Inc. for $450 million in cash and securities. Perlman was credited with having turned the ailing disk drive company into CDC's most profitable unit.



Perlman *assumes CDC title after search formalities*

The announcement had been expected, even though CDC's board in September established a search committee for the next CEO.

"This resolved an issue no one thought was one," said Gary Smaby, an analyst and managing director at Needham & Co. in Minneapolis, who said the perplexing part of the appointment was the formality of the executive search committee.

Regarding the senior-statesman status for Price, Smaby said this was a CDC tradition and was similar to the role played by CDC co-founder William C. Norris after Price became CEO in January 1986. "Perlman now has the title for the job he is performing," Smaby said.

CORRECTION

"Competitive manufacturing for the next decade," a conference cited in the Dec. 4 issue of *Computerworld*, was put on by Advanced Manufacturing Research, Inc., a Cambridge, Mass.-based research company.

A story on Datapoint Corp. in the Nov. 27 issue of *Computerworld* incorrectly stated that Datapoint lost $239.2 million on revenue of $312.9 million for fiscal 1989. The company actually lost $29.2 million for the fiscal year.

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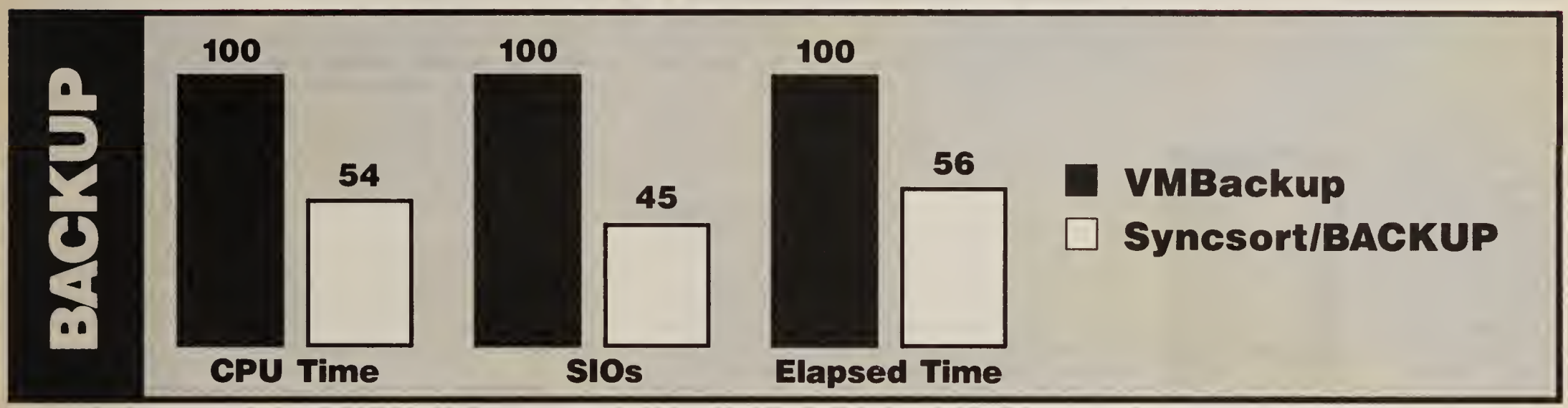

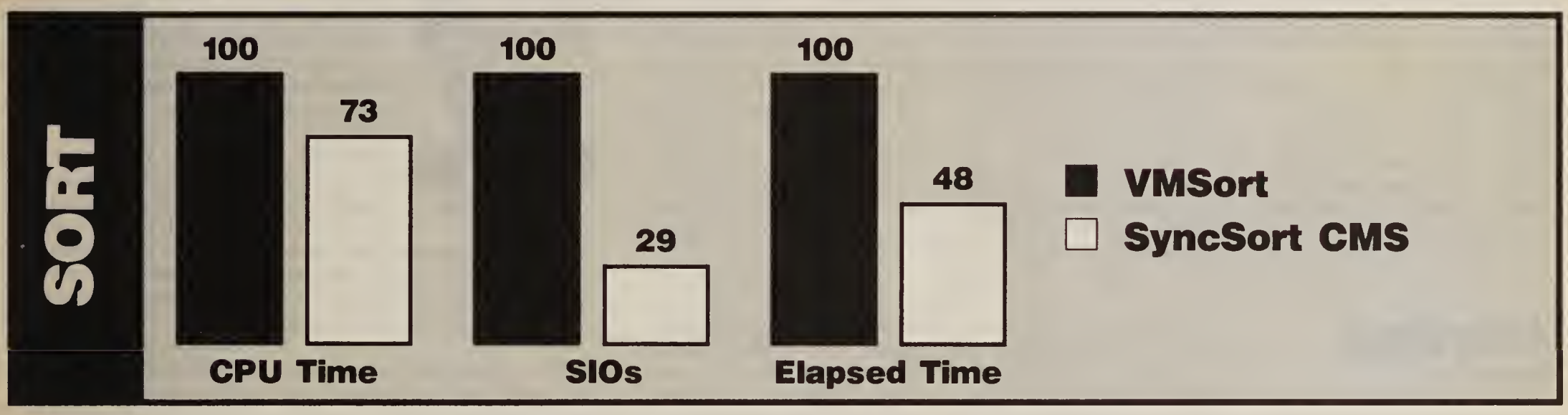

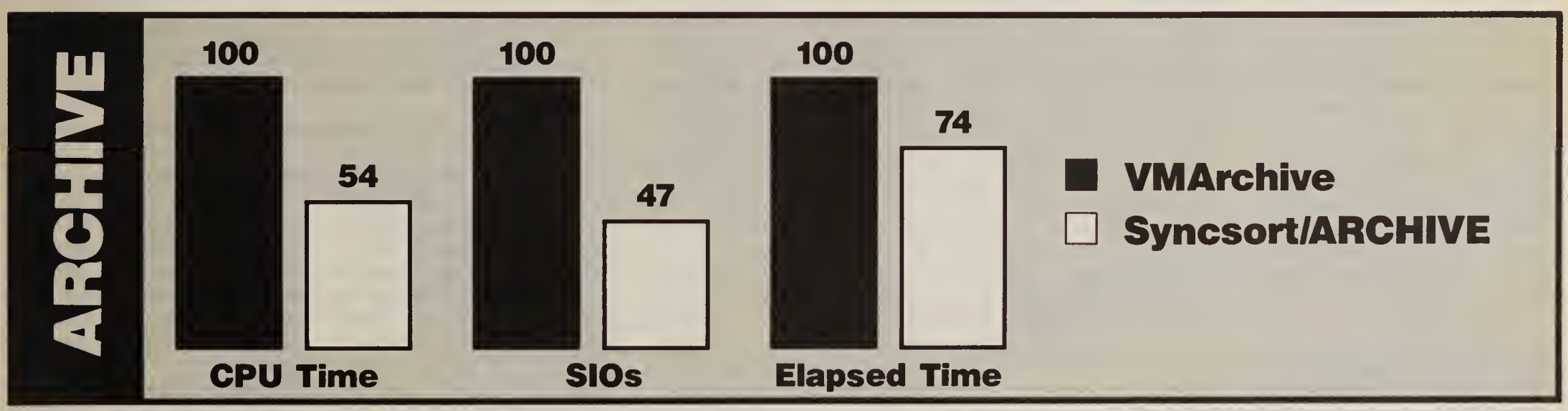

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IBM

FROM PAGE 1

consolidations, capacity reductions and modifying amortization practices.

Edward Nyce, executive vice-president for management information technical services at Manufacturers Hanover Trust Co. in New York, said IBM's cost-cutting was not deep enough: "I'm looking for some significant price reductions, and I haven't seen that kind of reaction from IBM."

IBM's Akers

Some analysts said he may get a reaction quite the reverse of what he wants. "Users' best days are over," said Robert Djurdjevic, president of Phoenix-based Annex Research. "Whenever companies bleed, users benefit, and benefits to users will start to diminish as IBM adjusts in the fourth quarter and will continue to throughout 1990."

Djurdjevic said a new IBM sales incentive program — based on profits rather than revenue — has already removed the incentive to discount and will induce a decline in mainframe price performance.

However, most customers and analysts questioned last week said that competitive pressures from Amdahl Corp. and Hitachi Ltd. will ensure discounting, although some wonder how long it can be used in the battle for market share before reaching a point of diminishing return.

"Amdahl and Hitachi will aggressively market, and that still looms as a very significant factor in keeping prices lower," Nyce said. "Everyone will reach a point where the profit margins will force them to stop, but I don't think we have seen that yet."

Frank Gens, an analyst at IDC Financial Services Corp. in Framingham, Mass., said IBM will now begin to expense manufacturing and development costs closer to the time incurred. Former accounting practices expensed those costs over a longer period and increased pressure on IBM to stave off new releases while it wrested a maximum return on its investment.

"If IBM gets lean, they make profit, and we get new products and end up winning," said George DiNardo, executive vice-president of information management and research at Mellon Bank NA in Pittsburgh.

Like other IBM users, DiNardo said that the actions will not have a negative impact on his organization. However, he conceded that IBM should have done more. "But nobody does it in big bites," he said. "You do it in these kinds of increments and see how it works at that level."

Hardware markdowns

Bill Mullin, vice-president of corporate information services at Pfizer, Inc. in New York, predicted that IBM will have to continue to discount. While "IBM and even DEC users can't readily change, they can change over time," he said.

New York-based independent consultant Frederic Withington said "that aggressive wheeling and dealing" will continue in the industry and that IBM will continue to drive down the price of the hardware. However, he expects software prices, particularly in DB2 and security software, to as much as double in the next year.

"I don't particularly care for the idea of software going up, but I do not think that there is anywhere else for us to go for it," said Vince Hilly, director of data administration at Depository Trust Co. in New York. "More and more, we are getting locked into IBM software and hardware, and IBM is going to cash in on it for sure."

Dissecting the cuts

HP's Young

"Let's face it, we've been doing the same kind of things," said Hewlett-Packard Co. Chief Executive Officer John Young. "In just changing the factory-floor kinds of things, there are a lot of people to redeploy."

"Why can't they call a spade a spade? What's the difference between a 'layoff' and 'highly selected attrition'? What this means is, instead of getting a pink slip, you get told to voluntarily retire: Otherwise, you're on your way to the Leningrad office, without a fur coat," said David Wu, an analyst at S.G. Warburg & Co.

"What people keep failing to acknowledge is the big constraint IBM is under. 'Respect for the individual' is the first tenet of the IBM company and the underpinning of the no-layoffs policy," said 30-year IBM veteran Sam Albert, who now runs his own consulting firm, Sam Albert Associates.

Lotus' King

"Programmer productivity is crucial," said former IBM executive Frank King, now senior vice-president at Lotus Development Corp. "IBM is already a low-cost hardware producer. The biggest fixed cost is the engineering and testing labs. The challenge is to develop software cheaply."

"We view our business as a chess match," said James A. Cannavino, vice-president and general manager of personal systems at IBM. He said that IBM is playing on multiple chessboards — offering multiple platform options — so it "can solve different problems for our customers. Our technical and strategic moves may seem at odds, but they are aimed at the same goals."

"IBM is saying that product cycles are shortening and that it will make sure that financial considerations do not hold it back," said Frank Gens, an analyst at IDC Financial Services Corp. in Framingham, Mass.

"IBM's no-layoff policy is not enough in an era of networked computing," said Richard A. Shaffer, editor and publisher of "Technologic Computer Letter."

Aftershock

FROM PAGE 1

have to cut their losers and ride their winners," Wu said.

While convinced that IBM has too many plants and employees, even after last week's cuts, Wu made it clear that by "losers," he meant of the computer kind. "If I were Akers," he said, "I'd can the 9370. Customers won't complain, and the company would gain natural attrition." He added that it would not stop with the 9370. "Do you really need a 4381?" he asked. "Can't you just bring in an AS/400?"

IBM, Wu said, would do well to study automotive industry history: "General Motors had the same problem [as IBM]: Too many midrange models competing for the same customer dollars, and none of them very distinguishable from each other or from last year's cars. Ford came in with fewer models, and each of them brand-new." IBM, he said, "has to be more like Ford and less like General Motors."

To some extent, analysts noted, no major move by a company the size and scope of IBM can be entirely without impact on the rest of the industry. For instance, Geran said, if IBM's latest cuts and any further such moves have their planned effect, competitors "will have a leaner, meaner IBM coming at them." However, most agreed, any perceived "contagion event" stemming from last week's announcement will be largely coincidental.

For instance, "DEC has been very good at following in IBM's footsteps, and we'll probably see similar [nonlayoff layoffs] coming from Maynard soon," said Robert Djurdjevic, president of Phoenix-based Annex Research. Neither Djurdjevic nor other commentators, however, predicted a torrent of copycat cuts from computer firms.

According to Rick Martin, an analyst at Prudential Bache Research, last week's signs that IBM is facing up to its profit margin problems could bode well for other computer companies.

Calling IBM's recent pricing strategies "the single largest factor in the industry's growth-rate slowdown," Martin speculated that the straits in which IBM finds itself could lead to aggressive pricing, particularly on new product lines. If so, Martin said — and if the market follows a proven historical pattern — aggressively low prices from IBM will stimulate buying, including from competitors, keying off a significant uptick in computer industry vitality.

At least one economist saw both the causes and the ramifications of IBM's current woes as having national and global import.

"This isn't an IBM story, and it's not a computer industry story," said Stephen Roach, senior economist at Morgan Stanley & Co. The slowing sales that are forcing the world's largest computer company to cut 10,000 jobs and write off $2.3 billion of expenses in its fourth quarter, Roach said, "clearly signal two forces at work: a very significant pullback in demand for information services and the foreign import penetration that is continuing with a vengeance."

The former, Roach said, stems from customers' keenly felt sensation that they have not reaped anything approaching a fair productivity return for the huge dollar amounts invested in information technology.

The tide of foreign technology at a time when the dollar is newly competitive, he said, is lamentably easy to explain: "We're losing our competitive edge."

IBM, he said — along with every other computer company — "is operating in a very tough environment. And it isn't going to clear up overnight." The worst any company, or industry, can do, he said, is ignore the problem; facing up to it, as IBM appears to be doing, is a step in the right direction.

> "IF I WERE AKERS, I'd can the 9370. Customers won't complain, and the company would gain natural attrition."
>
> DAVID WU
> S. G. WARBURG & CO.

Trying times

The last few years have been trying for IBM's revenue growth, and the company has responded with the following cutbacks:

September 1986: Announced worldwide early retirement program; 15,000 retired in 1987, including 13,000 in the U.S.

June 1988: Manufacturing operations closed in Boca Raton, Fla., and Tucson, Ariz.; headquarters operations consolidated; work force reduced by approximately 7,000.

September 1989: Announcement that 600 to 1,000 positions are expected to be eliminated by termination incentive at four U.S. sites — Endicott and Oswego, N.Y., Manassas, Va., and Lexington, Ky.

December 1989: Early retirement program and termination incentive expected to cut 10,000 positions by April.

Lotus releases Note-able net package

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — After a five-year gestation, Lotus Development Corp. last week rolled out Notes, the long-awaited groupware information management package.

Barely off the press, the product, a client-server-oriented applications platform for distributed networks, has already landed three significant accounts:

• A 10,000-unit sale to effusive beta-tester Price Waterhouse. "In two to three years, there may be more people on Notes here at Price Waterhouse than we currently have on 1-2-3," predicted Sheldon Laube, Price Waterhouse's recently appointed national director of information and technology (see story page 69).

• A year-long pilot under way at Manufacturers Hanover Trust Co., designed to consolidate, integrate and make accessible to account officers large amounts of financial and other customer information. "The potential for Notes here is very large — about 1,000 to 2,000 people," said Patricia Sziklai, vice-president of automation services.

• A development effort at Reuters Information Services, Inc. for applications using Notes to disseminate real-time news to customers on networked personal computers. Lotus has written an interface linking the Notes server to Reuters' news wire.

Functions in Notes include distributed document databases, correspondence processing, computer conferencing and other communications tools, as well as a document database. Lotus has been working on the product for five years, and company officials claimed that 30 corporations have participated in a 2-year-long beta-testing process.

First competitor

In some quarters, Notes is being positioned as the first PC-based competitor to host-centered office systems such as IBM's Officevision, itself heavily oriented toward electronic mail, Digital Equipment Corp.'s All-In-1 and Hewlett-Packard Co.'s New Wave. As such, Notes could benefit from the growing movement toward downsizing.

"In essence, it's the second generation of integrated office applications," said David Bayer, a software analyst at Montgomery Securities, Inc.

While some observers have shrugged it off as little more than "sexy E-mail," others have anointed Notes as the first application to really give users a reason to move to OS/2 and a client-server architecture.

"I have talked to a number of users who have said this is the first good reason that MIS has had to go to OS/2," Bayer said. According to Lotus, Notes serves DOS- and OS/2-based workstations via OS/2 servers.

Ironically, however, Notes is Lotus' first Windows offering. When asked if Lotus is undermining its OS/2 campaign by offering Windows support on the client, Frank King, senior vice-president of Lotus' Software Products Group, responded that Lotus is "pragmatic."

Laube conceded that, for the first year, Notes will run under Windows. In three years, however, 90% of those clients will be running under OS/2 on 386 boxes, he predicted.

Because it falls into two emerging and nebulous product categories — personal information management and groupware — it is difficult to explain what Notes is and why anyone would want to use it. It essentially would function as an environment under which teams of users can collect, share and distribute information — documents, numbers or images — over distributed enterprise networks. "Our competitive edge is our people, and the most effective way to maintain our advantage is through capturing and disseminating their accumulated knowledge so that we can leverage it across the firm," Laube said.

No one said last week that they expect Notes to be an overnight success. King was frank in admitting that Lotus is groping its way around the groupware market. "We just don't know all the answers to those questions" about how to market and support Notes, he said.

Lotus faces the following challenges with Notes:

• Users have to be willing to take on customization and gateway development.

• The pricing strategy — $62,000 for a 200-device license — means Lotus is going to have to convince some large accounts to reach into deep pockets. Additional nodes can be added for $295 each.

• It is pioneering a new market that requires a more sophisticated sales and service approach, with Lotus opting to avoid its traditional retail sales distribution in favor of direct sales.

However, Lotus could run into trouble with its decision not to provide "canned" database import facilities. Instead, Lotus is providing tools so users can write their own.

"You have to look at this as a barrier to acceptance," said Nancy McSharry, a software analyst at International Data Corp. "Where do most companies keep information? In databases," she added.

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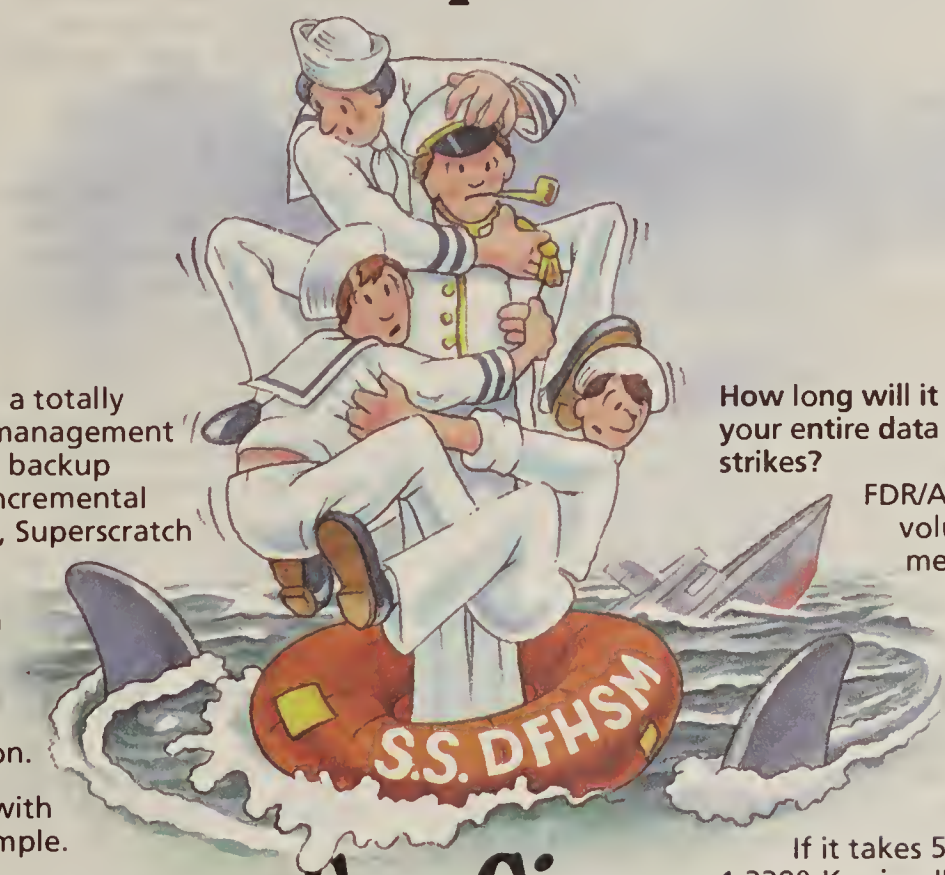

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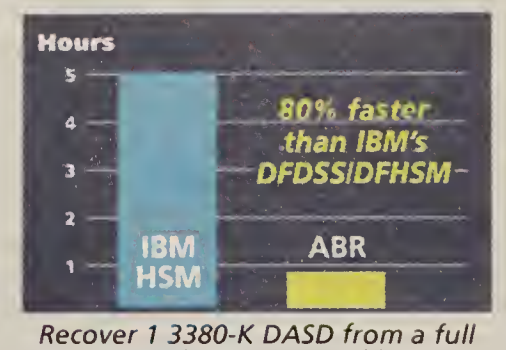

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NEWS SHORTS

System targets doctors

Blue Cross and Blue Shield of Illinois installed a computerized screening system last week to catch doctors whom it said sometimes triple the charges they bill the insurer for medical procedures. An in-house programming team spent four months reprogramming its computers to recognize "unbundling" of charges, whereby some unscrupulous physicians break a single operation into components and submit a separate claim for each part. Blue Cross, which said the excess charges may be costing it $25 million annually, said it hopes to share its software remedy with other Blue Cross companies.

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Bull, Zenith pass trade hurdle

Zenith Electronics Corp.'s proposed sale of its computer division to Paris-based Groupe Bull has passed a review of national security and foreign ownership issues, the company said last week. The Committee on Foreign Investment in the U.S. notified both Zenith and Bull that no investigation is necessary under the Omnibus Trade and Competitiveness Act of 1988. The two companies, which still must clear some remaining regulatory hurdles and gain approval by Zenith stockholders, hope to complete the sale by year's end.

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Timeplex president resigns

Victoria A. Brown stepped down from her position as president of T1 switch vendor Timeplex, Inc. last week to "move on and pursue other interests." Brown, who joined Timeplex in 1976, was named president in January 1988, around the same time that the company was acquired by Unisys Corp. Brown's successor will be Dewaine L. Osman, president of Unisys' Communications and Networks Group, which is responsible for the vendor's network management systems. Osman's appointment does not change Timeplex's status as "an independent company, aggressively pursuing its own market," Brown said.

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British Telecom offers Basic Rate

British Telecom, Inc. last week announced ISDN2, a service said to provide two 64K bit/sec. digital connections. The service reportedly adheres to the CCITT Integrated Services Digital Network Basic Rate Interface standard. General deployment of ISDN2 is scheduled to begin at the end of next April, with full deployment across major UK business centers to be completed by the end of 1990. The carrier announced a proprietary ISDN Primary Rate Interface service in October.

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Borland unwraps bundle

Borland International announced last week that it will unbundle portions of its Paradox relational database, giving corporate developers access to its C library. The announcement offers no new technology but will give developers increased flexibility in managing Paradox tables and integrating other Borland application packages.

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Portable mainframes?

Mainframes in California cannot be taxed as if they were part of a building, which means some banks and insurance companies can get refunds from past property taxes, according to a recent state Supreme Court decision. Crocker Bank, now part of Wells Fargo Bank NA, stands to collect $2.5 million in refunds after winning its protest of San Francisco County's method of treating mainframes as "permanent fixtures." The ruling applies only to banks and insurance companies because the state exempts them from personal property taxes. The decision noted that even huge mainframes can be unplugged and rolled around, which differentiates them from permanent fixtures.

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Bullis resigns Wang post

Wang Laboratories, Inc. Chief Financial Officer Eugene Bullis will be leaving the troubled minicomputer maker in early January, the firm said last week. The departure was a mutual decision, according to Bullis and President Richard Miller.

Sun lunges toward midrange

BY JAMES DALY
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. sprang from its long commando crawl toward the midrange last week, brandishing a pair of file servers aimed squarely at wresting the lead in the minicomputer market away from such entrenched competitors as Digital Equipment Corp. and IBM.

The high-end Sparcserver 490 and entry-level Sparcserver 1 announced last week significantly broaden Sun's product line beyond its traditional technical workstation foundation and will punch up the company's efforts to portray itself as a soup-to-nuts computer company in order to drum up sales in the commercial sector.

"It's a giant step forward; Sun is in the minicomputer business," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "Sun now has the ability to go from the departmental to the desktop level in a binary-compatible way — which is the same argument DEC has used for years."

The big move

Minicomputers have long been used as network file servers, which transmit data and instructions between networks and other machines at extremely high speeds. However, their high cost — some DEC VAX machines cost more than $300,000 — has led some to use servers that simply act as traffic cops dispensing information rather than doing any computing themselves.

While Sun's workstations have been jury-rigged to serve as file servers by removing the terminal and plugging the machine into the network, the I/O throughput, bus speed and communications management facilities were skimpy, Sun officials acknowledged.

The flagship Sparcserver 490 neatly ups the ante for Sun. "You can't call us just a workstation company anymore," President Scott McNealy claimed. "These machines provide what some people are looking for from mainframes."

Sun impression

In comparable configurations of 32M bytes of memory and 2G bytes of disk storage, Sun rates its Sparcserver 490 as the low-cost, high-powered leader

	Price	MIPS
Sparcserver 490	$129,000	22
Decsystem 5810	$197,000	18.7
VAX 6000 Model 410	$310,550	7
Pyramid MIS1	$150,000	14

SOURCE: SUN MICROSYSTEMS, INC — CW CHART: JOHN YORK

Both models will be powered by Sun's Scalable Processor Architecture (Sparc) reduced instruction set computing-based chip.

The Sparcserver 490 can process up to 22 million instructions per second (MIPS) and is priced at $113,900 for a system with 32M bytes of main memory and 2G bytes of storage. The Sparcserver 1 starts at $18,900 for a configuration with 8M bytes of main memory and 654M bytes of disk storage. The Sparcserver 490 will be available by the end of the month, while the Sparcserver 1 is scheduled to begin shipping in early January.

Although the Sparcserver 490 does not offer the sophisticated data management capability of a full-blown minicomputer, its attractive price/performance is a trade-off some early assessors are willing to accept.

"A VAX MIP is an expensive MIP; Sun is much more reasonable," said Craig Eades, Unix group leader at the Lawrence Berkeley Laboratory in Berkeley, Calif., where a Sparcserver 490 has been installed.

Sun officials claim the servers have hit the ground running. Eric Schmidt, vice-president of the general systems group, said Sun expects to ship $10 million worth of the machines by the end of the year.

The announcement comes at a time when desktop system manufacturers are increasingly targeting the real estate of the midrange for future expansion plans.

Early last month, Compaq Computer Corp. waged its own assault with the introduction of the memory- and storage-intensive Systempro line, which can provide computational support for more than 100 users [CW, Nov. 13].

Social Security systems can't handle law repeal

BY ELLIS BOOKER
CW STAFF

If laws are hard to change, software programs are even harder. Last week, the U.S. Social Security Administration said it will be unable to reprogram its computers until next spring to respond to last month's repeal of the Medicare Catastrophic Coverage Act.

As a result, most of the 33 million recipients of Social Security benefits will continue to see the higher and highly controversial premium charges that the Catastrophic Coverage Act put in place. The total amount of the excess charges could top $1 billion.

"We will unscramble this egg, but we did not lay it," Social Security Commissioner Gwendolyn S. King said last week. King put much of the blame on Congress, which repealed the act on Nov. 22 before it adjourned Thanksgiving week.

A spokesman at the Social Security Administration's data processing center in Baltimore said the agency ordinarily takes nine months to make annual changes in cost-of-living adjustments (COLA) and the supplementary medical insurance, better known as Part B Medicare. "We've never had to remove an adjustment," the official said.

Persons who receive Social Security and get Medicare have their premiums deducted from their Social Security checks. About 27 million of the 33 million Social Security recipients fall into this category.

Once the 230 different types of premiums are fixed in May for June 3 checks, the agency will need to develop a program to refund recipients. However, the refund will not bear interest. Social Security Administration policy is to not pay interest for overpayments or charge interest for underpayments.

The Social Security Administration uses a variety of hardware platforms, including mainframes from IBM, National Advanced Systems — now Hitachi Data Systems Corp. — and Amdahl Corp. The software programs — some 150 programs representing 27 subsystems are involved in the rewrite — are a combination of programs developed by the Social Security Administration and customized vendor packages. About 100 programmers and analysts will be assigned to the rewrite project.

According to the Social Security Administration, the most visible part of its systems modernization program in the 1980s was an on-line system between Social Security offices in the field and the Baltimore computer center.

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1:IBM Journal of SAA 2:DATAPRO survey, August 1988, companies with sales over $10 million 3:Donaldson, Lufkin & Jenrette report

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COMPUTERWORLD

DEC colors in imaging outline

BY AMY CORTESE
CW STAFF

NEW YORK — Digital Equipment Corp. last week added some definition to the imaging strategy it sketched out last January. But while the new products and alliances broaden DEC's imaging capabilities and fill in some blanks, analysts said the firm needs to take further steps to be a force in that emerging market.

DEC's initial image announcement laid out a framework for incorporating images into applications, but initial product offerings were limited to the VMS operating system and one scanner for image input. Last week's follow-up — dubbed Decimage — added Ultrix support, an image storage manager and some key vendor alliances, expanding DEC's imaging options.

DEC's image strategy is built upon its Network Application Support services, a set of common application services that include DEC's Compound Document Architecture (CDA).

"DEC shares Wang's philosophy that data types need to be managed and integrated into a compound document," said Pam Bliss, an analyst at San Jose, Calif.-based Dataquest, Inc. "Rather than build big custom-image applications like IBM is going after, DEC is building image in as just another data type."

While this approach is seen by analysts as a benefit in the long term, it leaves it up to users to create imaging applications.

Analysts said this tool-oriented approach puts DEC at a disadvantage relative to IBM and other image vendors that sell more complete packages of software and services. Image applications are complicated, analysts contend, and in many cases users do not want to build them themselves.

Ron Carron, assistant manager of the Engineering Computer Facility at Technicon in Tarrytown, N.Y., said he believes DEC's strategy is a good one. DEC is "integrating image with Decwindows in a way that will be usable in a lot of different applications."

Carron is writing an application that will use Decimage services and Decwindows to pull up images on-screen, which he said he estimates will take eight months.

Support centers soon

To counter this, however, DEC announced plans to establish customer centers specializing in providing imaging support starting in early 1990. The company said it would provide customers with consultation, planning and integration services.

Analysts applauded DEC's moves to establish partnerships with third-party hardware and software suppliers. Most notably, DEC strengthened its relationship with Eastman Kodak Co., whose imaging peripherals and image management software extend DEC's image-handling capacity. An agreement with Laserdata, Inc. will broaden DEC's desktop image support to include Laserdata's MS-DOS-based image workstations.

Additionally, eight other vendors will provide image peripherals and software that conform to DEC's CDA.

Two partners will provide industry-specific applications for credit union and legal document management applications; analysts said, however, that DEC will have to provide more third-party applications.

Analysts also criticized DEC's lack of a high-end offering for large check or credit-card processing applications. But DEC does not currently have a strong presence in such accounts, and it is not likely to make much headway with an image offering in this area, said Tom Nolle, president of CIMI Corp., a technology assessment firm.

The currently $1 billion imaging market is a young one, with sales so scattered that analysts said share figures are not meaningful at this point.

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U.S., Japan supercomputer talks flag

BY ELLIS BOOKER
CW STAFF

WASHINGTON, D.C. — Trade talks between the U.S. and Japan over access to the Japanese supercomputer market have ended for the year without a settlement.

An interagency delegation led by William Piez, a senior policy adviser for the Office of the U.S. Trade Representative, met with Japan officials in Hawaii in September and again in Tokyo late last month. The trade talks will resume in late January or early February.

Earlier this year, the Bush administration charged that Japan uses structural obstacles that hamper U.S. supercomputer vendors who do business in its public sector. Japan, which has maintained that it has no such barriers, was cited in May under the so-called Super 301 clause of the 1988 Trade Act.

U.S. supercomputer companies have a 20% share of the private Japanese sector but less than 6% in the public sector, a federal trade official said. He reiterated the U.S. request that the Japanese use "nondiscriminatory performance-related" standards when issuing bids for supercomputers.

The U.S. also wants Japan to end its policy of "ruinous government discounts," the official said. Those discounts, which the official said run up to 85% for high-performance computers, make it impossible for U.S. firms to compete with domestic Japanese computer companies.

Unless the dispute is resolved by June 16, the Super 301 citation mandates "balanced and relevant" retaliatory trade restrictions. Noting that the $100 million Japanese supercomputer market is tiny compared with the total trade balance between the U.S. and Japan, the trade official said that if it comes to trade sanctions, "We'll have to find an imaginative way to have as big an impact as possible [within a $100 million market]."

The notion of trade retaliation against the Japanese has produced two schools of thought, said James P. Gallatin Jr., an international trade attorney and a partner at Gaston & Snow in Washington, D.C.

"One sector of the computer community says we're heading for a showdown and we have to prepare," Gallatin said. "Another says that at some time this is all going to blow over very quickly and suddenly and that it would be real hard and dangerous to retaliate in the area of computer products."

Fujitsu bags discounted super pact

TOKYO — Fujitsu Ltd. won a contract to supply two supercomputers to Japanese government research laboratories at an effective discount of 60%, according to government officials quoted in Japanese press reports last week.

In a move that would make discounts seem smaller, Fujitsu recently trimmed its stated rental fees for its supercomputers by about 30% to stave off U.S. criticism. Japanese supercomputer makers NEC Corp. and Hitachi Ltd. followed suit.

The actual 25% discount in Fujitsu's recent bid — added to the masked 30%-plus discount that previously existed — amounts to an effective discount of 60%, according to the reports.

Ironically, the company ended up being the only maker to bid on the government's tender.

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4M-bit

FROM PAGE 1

Scottsdale, Ariz. "And I hope people aren't that shortsighted that they'll allow U.S. Memories to become just that — a memory."

Vendors such as Apple Computer, Inc., Sun Microsystems, Inc. and Compaq Computer Corp. have passed on the idea of investing in the group because today's supply of 1M-bit chips is adequate.

Only a year ago, however, the situation was far different. Japanese chip makers had sharply scaled back production, causing shortages and high prices.

While the price of 1M-bit chips has returned to normal — they can be had for as little as $7 each, compared with nearly $40 per unit late last year — a new generation of systems requiring large amounts of memory is shifting focus from 1M-bit chips to 4M-bit technology.

Enlarged chip capacity is becoming essential because the three leading operating systems for advanced desktop computers — OS/2, Unix and Apple's Macintosh — all require far more computer memory than their predecessors.

"In a year and a half, it will be darn hard to find systems that don't have 4M-bit chips in them," said Andrew Heller, a consulting partner at Kleiner Perkins Caulfield and Byers, an investment firm based in San Fransisco.

Japanese vendors are already minting 4M-bit chips in quantity, according to Drew Peck, an analyst at Donaldson, Lufkin & Jenrette, Inc. in New York. U.S. chip makers, meanwhile, have been groping for a workable manufacturing recipe. So far, domestic 4M-bit availability is a year behind initial predictions and six to nine months behind the Japanese, analysts said.

"It took longer than anyone initially expected," Peck said. "The manufacturing process was a lot tougher than anticipated" because it differs so radically from that of previous generation chips.

Observers do not expect Motorola, Inc. and Texas Instruments, Inc. to ship the chips in any quantity before the end of first-quarter 1990 and possibly not until the latter half of the year.

As with all next-generation technologies, the new chips command a premium price. Domestic samples now sell for as much as $100 apiece. Once quantity shipments begin, it may take another six to nine months for the price per bit to reach parity with that of the current chip generation, Peck said.

Until then, users will see the chips almost exclusively in memory-hungry high-end workstations and file servers.

IBM is one firm that has no need to wait on the domestic makers or turn to Japan; it has been producing its own 4M-bit chips since early summer.

The chips have already found their way into upgrade boards for IBM's Personal System/2 Models 70 and 80. The company's upcoming replacement for the RT workstation is also likely to use 4M-bit chips, although IBM would not confirm this.

Private pipeline

With its private chip supply, "IBM theoretically could have an advantage" over its competitors, said Michael Gumport, an analyst at Drexel Burnham Lambert, Inc. in New York.

"It certainly positions them to be among the first to market with the product," added Bruce Stephen, an analyst at Framingham, Mass.-based research firm International Data Corp.

However, observers are doubtful that IBM will gain an advantage in pricing. "Maybe in the long term it will give them a price advantage, but I'm sure the other suppliers will price comparably" in the near term, Stephen said.

Hewlett-Packard Co. also plans to use 4M-bit chips in memory upgrades for its Vectra 486 PC, due to ship in the first quarter. HP has a contract with a Japanese supplier but will re-evaluate its chip source when domestic supplies finally arrive, the spokesman said.

By then, however, Japan will likely be well on its way to building the next-generation chip — the 16M-bit variety.

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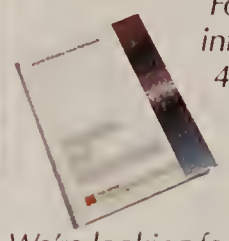

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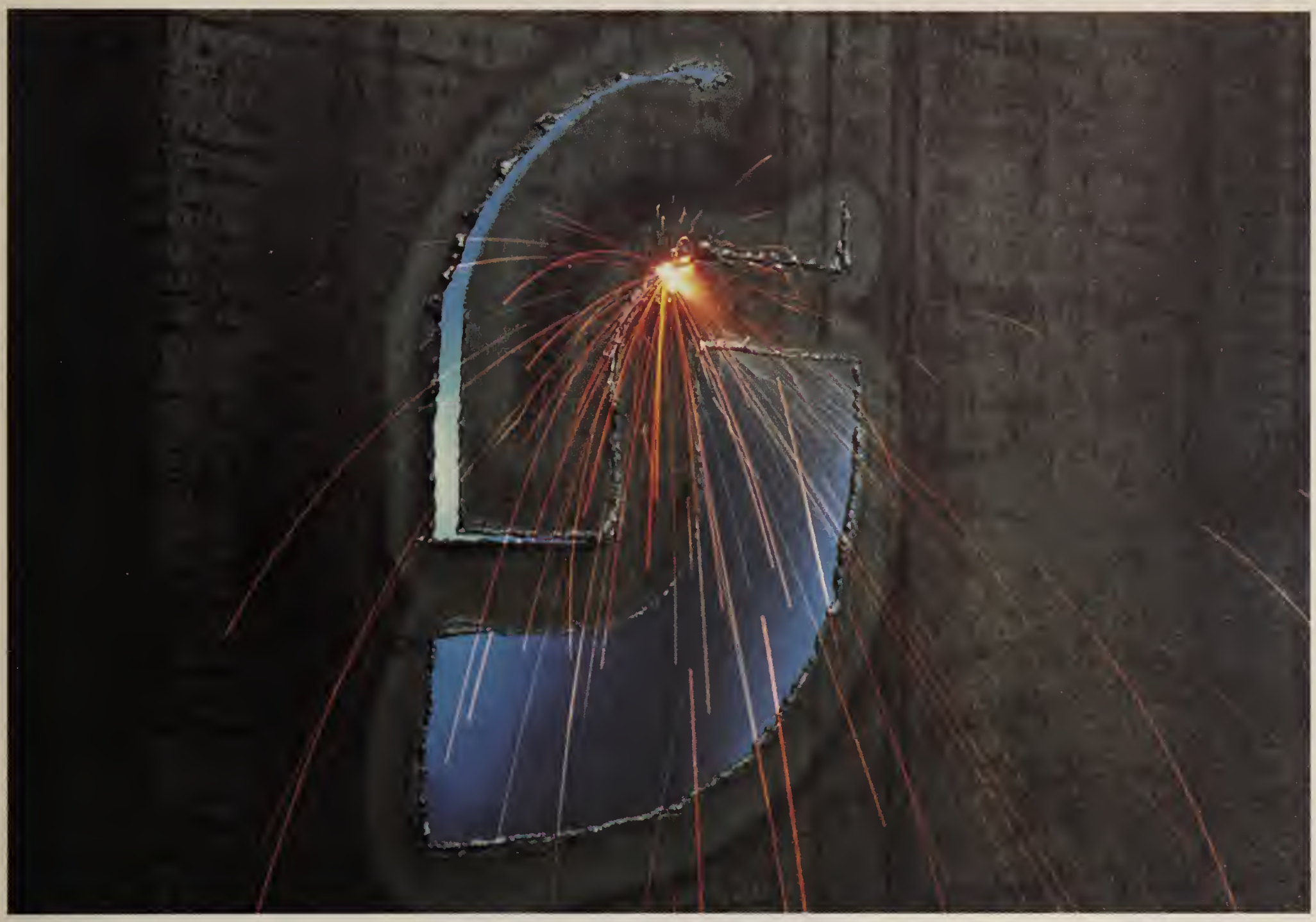

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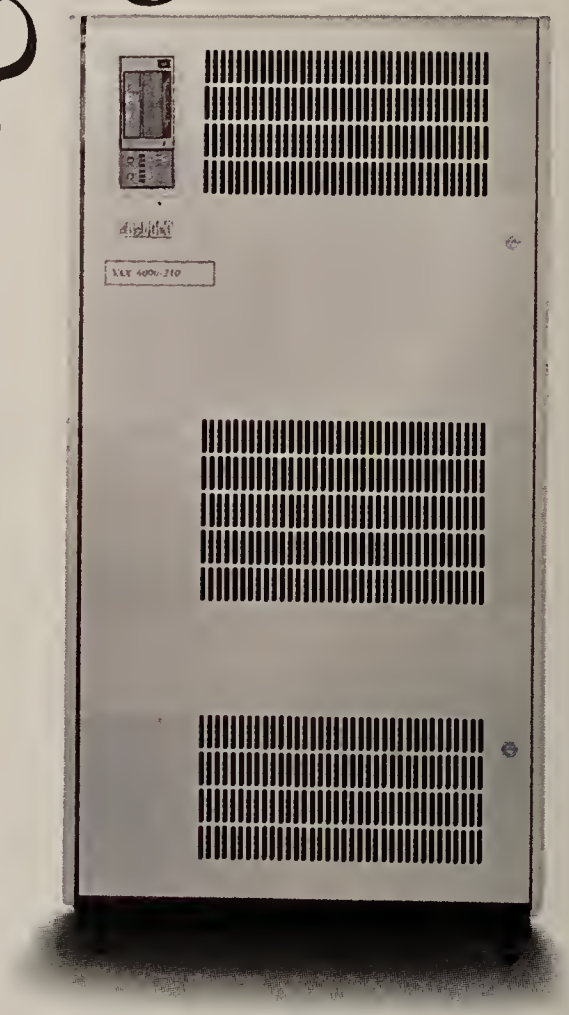

VAX 6000 Computer
2.8 VUPs (10:30 a.m.)

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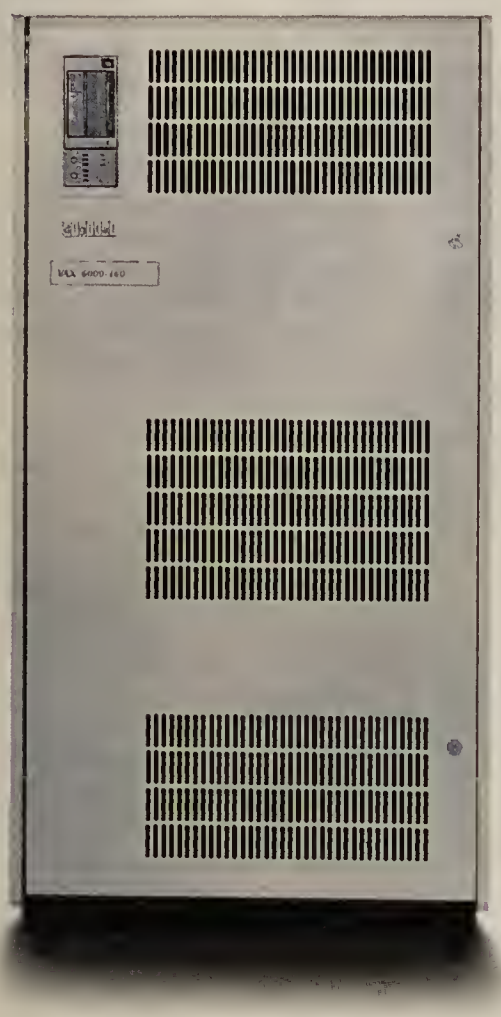

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Manufacturers view future IS strategy

BY ALAN J. RYAN
CW STAFF

BOSTON — External pressures from competitors and customers are forcing manufacturing companies to rethink their information systems strategies — including those for marketing and assembly lines — for the 1990s and beyond, said speakers at last week's International Conference on Information Systems.

"Customers want a lot of variety," said Sunder Kekre, an associate professor in Carnegie-Mellon University's Graduate School of Industrial Administration. "Options add to the burden of manufacturing."

A notable example, Kekre said, is the automobile industry, where "information systems have to help us understand what is happening on the shop floor."

That understanding will lead to the challenge of systems workers having to "support a new and more complex systems environment" within the constraints of faster implementation of systems, reduced capital and fewer skilled workers, said Robert W. Booth, manager of systems design and integration at General Motors Corp.'s Truck & Bus Group in Pontiac, Mich.

In the next decade, manufacturing companies will have to adhere to and drive industry standards, Booth said.

Other changes companies will make in the '90s, Booth said, are the use of fewer large custom applications software packages, the increased use of more user-configurable "throw-away" application code and the forging of strategic partnerships for products and services.

The GM executive said the external environment for manufacturing, especially in the automobile industry, has changed dramatically in North America. Foreign competition and pressure from niche products require manufacturers to bring products to market quickly.

External pressures are bringing about increased systems focus within Eastman Kodak Co., according to Helen D. Newman, manager of corporate sourcing: "The mission of corporate information systems is to move to the state where managers of Eastman Kodak manage systems as an asset and a strategic, integral part of the company."

Additionally, she said, the company is moving in the direction of greater commonality of systems in the personal computer area. "It is too expensive to support many different systems," she said. So, Kodak is moving "to a small subset of hardware and software platforms which will serve 80% to 90% of the need within the company."

Also, Kodak is hoping to save $1 billion to $1.5 billion over the next 10 years through its alliance with IBM, whereby IBM will manage Kodak's mainframe computing data centers in Rochester, N.Y., and Kodak, Colo. Kodak also began receiving all PC support services from Businessland this month and is negotiating with Digital Equipment Corp. for a telecommunications partnership.

With the partnerships falling into place, Newman said Kodak's corporate IS group will eventually be composed of only a small staff; most of the IS workers within the companies will report directly to the areas of the company that they support instead of the IS group.

Intel, NEC bury the hatchet on copyright battle

BY JAMES DALY
CW STAFF

One of the longest-smoldering feuds in the computer industry cooled last week when Intel Corp. and Japan's NEC Corp. reached an out-of-court settlement that buried the last remaining sparks in their 5-year-old microcode copyright suit.

Neither company would disclose the specifics of the settlement.

The decision follows a February ruling by U.S. District Judge William P. Gray that held that although Intel could secure a copyright for its 8086/8088 internal chip design, the company forfeited that protection when it failed to use the appropriate copyright symbol. In any case, Gray ruled that NEC's V-Series microcode did not infringe on Intel's copyrights.

The case was seen as important in determining whether similar chip designs are the result of copying or simply unavoidable. Attorneys from both sides said the case had dragged on too long and the debate over the older technologies was no longer worth pursuing.

In agreeing on the settlement, NEC also dropped a counterclaim of unfair competition that was to be tried next month.

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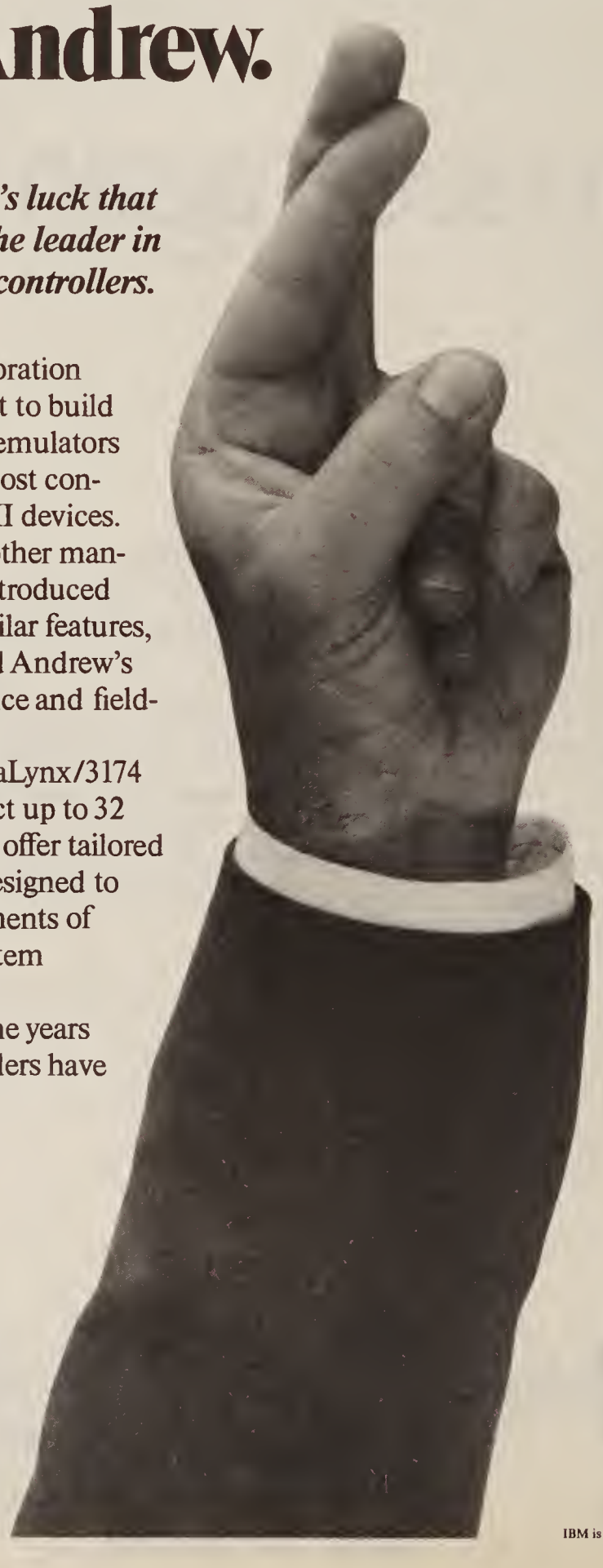

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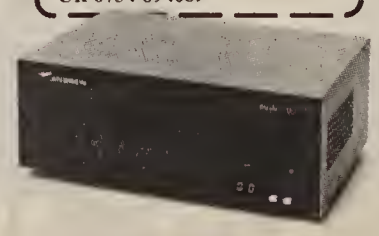

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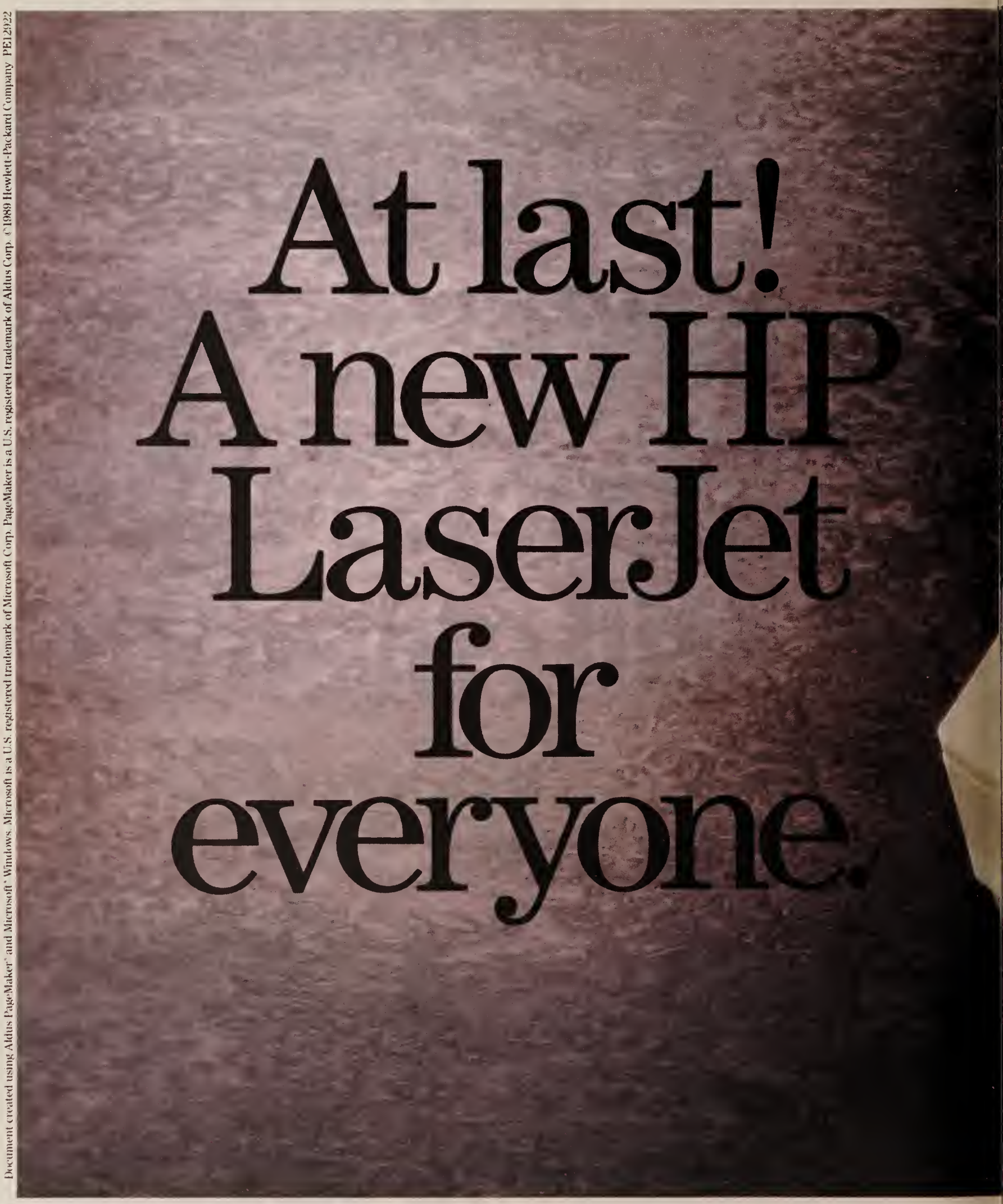

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Vendors at sea

HOW NOW, BLUE cow?

IBM's most recent restructuring, announced last week, raised a lot more questions and doubts than it settled. Not so much about company issues, but about the direction of the industry as a whole. These days, about the last thing IS professionals need is another shot of FUD.

IBM is at the head of the high-tech flotilla with a busted compass. The rest of the fleet is no better off, as evidenced by the actions so many have taken in the past year resulting from unfavorable weather.

It is not as though customers are not buying product. Of course, in the U.S., sales of computer products have slowed, but they are still close to double digits in the aggregate. And abroad, where the vendors routinely do half their business, sales are quite brisk, easily growing at double-digit rates and expected to continue to do so.

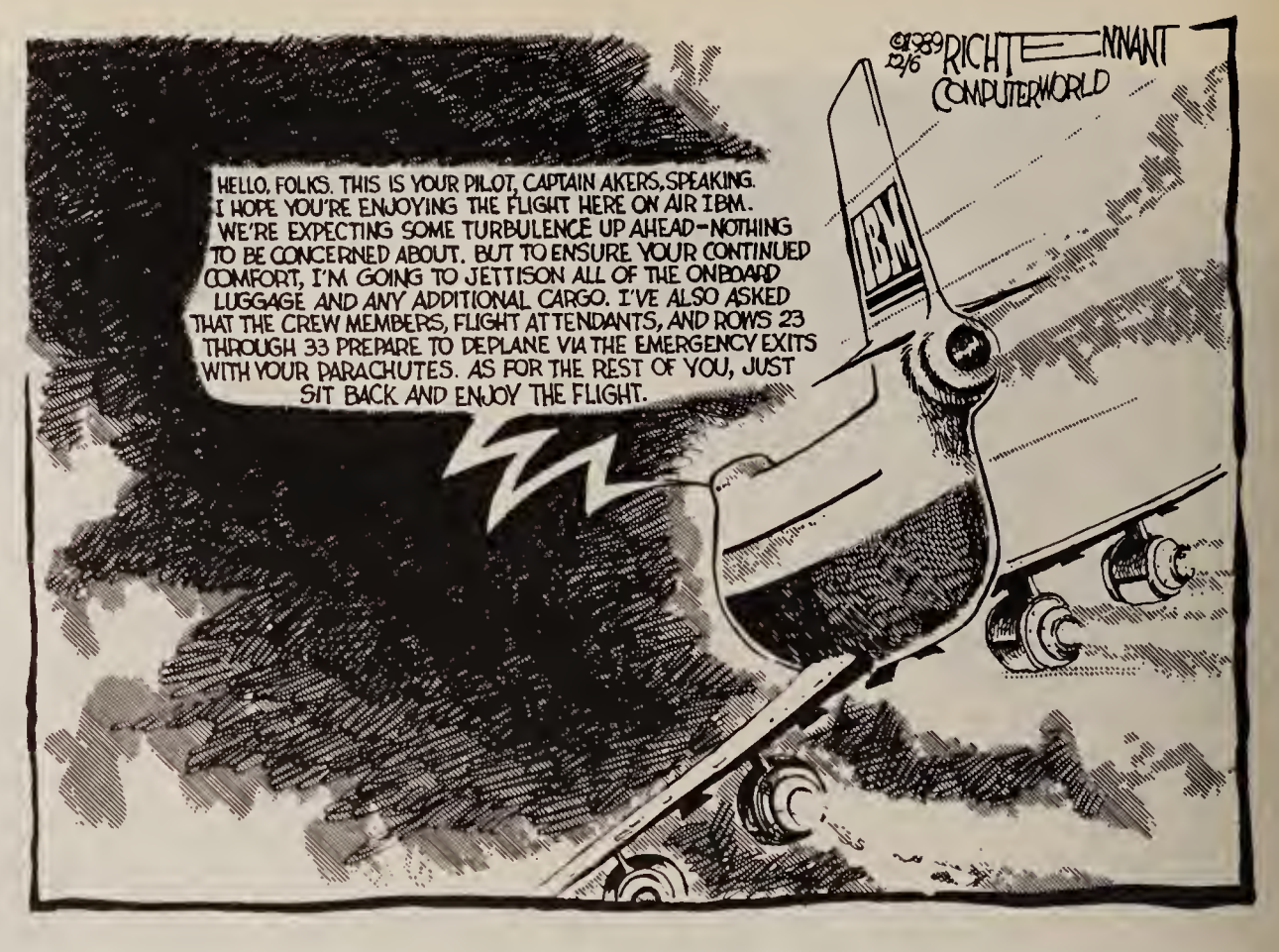
The problem is that competition has made a mess out of the profits the vendors once enjoyed. There is no reason to believe this situation will improve in the next 12 to 24 months. On the contrary, the current excess supply situation will likely result in the following in the next year:

- **The most prolonged period of steep discounting on hardware in memory.** Being so dominant, IBM will call the tune in the mainframe market. The Japanese, acting through U.S.-based agents Amdahl and Hitachi Data Systems, will sense an opportunity to increase market share, profit margins be damned. And IBM will act aggressively to boost mainframe sales as buyers begin to anticipate the upcoming Summit series mainframes. It will be a free-for-all.

Ditto in the hottest hardware market, workstations. Again, IBM will apply the juice with very speedy and spiffy units in 1990, pricing them to gain market share and presence in a key market where it is largely invisible today. Sun and HP will react accordingly.

Minis will be very aggressively promoted, given the sagging positions of virtually all major mini makers.

- **Deals loaded with front-end and back-end goodies.** Even when they feel obligated to raise prices, car makers get creative with financing, effectively lowering the price of ownership. The hardware vendors will get very creative here, and the advantage can go to the big companies, whose financing costs are usually the lowest. Also, look for total systems vendors to start doing more deals that might resemble bundling (but don't tell the government that), not only with software but with support and even network services.
- **Warning flags are bound to fly.** With the U.S. market destined to grow very little next year, heavy discounting will bring some vendors right to the brink. Beware the deal that sounds too good to be true. It probably will become exactly that. There's only so much fat in any vendor organization where the meat and bone consists of support, research and development and general product quality.



LETTERS TO THE EDITOR

No pain, no gain

Lester Thurow is one of my favorite writers on management in America, so I enjoyed "An unvarnished view of IS efficacy" [CW, Nov. 13]. Thurow agrees that U.S. management is suffering from 45 years of believing its own press releases. We continued to rate ourselves as best long after other countries had made our own self-serving definition of best obsolete.

More than 30 years ago, when I was a programmer/analyst at McDonnell Aircraft Corp. in St. Louis, I was involved in automating its personnel department. Our work was coordinated by the Administrative Systems Department, so I had the chance to deal with them fairly often.

Over the years, I have had occasion to recall more than once a conversation with one of them during which I was congratulating myself on how much money would be saved with my computer programs. Once he stopped laughing, he pointed out that there was never any money saved by adding a computer to a manual process. The only hope for reducing expenses was to eliminate or replace manual processes with the computer.

He knew it then. I grew to believe it over the years. Lester knows it now. As Thurow said, awareness of "truth" on an intellectual level doesn't automatically translate to change on an emotional level. When the prospect of pain from continuing as we are headed overcomes the anticipation of discomfort from change, we will modify our behavior. Until then, it's muddling as usual.

E. R. Gates
Director, Technical Support
Illinois Power Co.
Decatur, Ill.

Get the point

Your editorial "Give and take" [CW, Nov. 27] repeats another Department of Defense fable that attempts to delude the public into believing they are getting real value for money from defense contracts: The ball-point pen was developed for the U.S. Air Force in the 1930s. What's next: the old canard about "teflon" and the U.S. space effort?

A quick perusal of the *Encyclopaedia Britannica* will acquaint you with the facts that, in part, the first patent for a ball-point pen was issued on October 30, 1888, to John Loud, and the first real ball-point pen as we know it was patented by Lazlo Biro, a Hungarian living in Argentina in 1944. In fact, ball-point pens are called "Biros" in Australia and the UK even today.

Jon Butler
Arlington, Va.

Small into great

In "Call it unfair at the job fair" [CW, Oct. 23], Michael Cohn humorously related the isolation he experienced manning the data processing booth at a job fair. It seemed that no one was interested in the entry-level positions he was trying to fill. Perhaps one of his problems was demonstrated in the use of the phrase, "college seniors."

Four-year colleges are not the only schools that are currently training people in data processing, and if Cohn investigated his local technical school or other schools in nearby cities he might find a number of eager graduates who would be very interested in considering his entry-level program. They would be delighted to accept the challenge of a job with "intense mainframe training, a year or two in systems development and even some exposure to state-of-the-art database applications."

Who are these two-year college graduates? If you look at individual schools you will find many with high standards that are turning out graduates skilled in problem-solving and well trained in Cobol, PRGII and a job control language, students who can take a problem apart and create a concise, step-by-step solution.

A large number of these graduates have several years of experience working in another field. They have often had experience dealing with superiors and customers, meeting deadlines and double-checking results. Some, lacking self-confidence after graduating from high school, made bad choices about what sort of work they could do, totally undershooting their hidden abilities.

They have returned to school to apply the natural talent and determination that is dormant in them to a high-skill, high-paying field of study.

Employers who struggle to fill those entry-level training programs should remember the words of Francis Bacon: "Mean and small things can discover great, better than great can discover small."

Lee Westbrock
N. Charleston, S.C.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

It's time to make room for baby

GLENN RIFKIN

My wife and I were told more times than I could count how our new baby was going to change our life. Despite the warnings, there was nothing that could have prepared us for the drama that followed his birth.

The initiation into the world of parenthood is a heady walk between wonderfulness and disaster. I cannot imagine how someone could handle it alone, or as a teenager or in poverty. Despite the sleepless nights and sudden loss of freedom, I know that it is the best thing that has ever happened to me.

Beyond all the emotional barriers that we continue to hurdle each day of his life, our baby has thrust my wife and me squarely into a dilemma that promises to be among the chief concerns of U.S. business in the coming decade: dependent care.

Although we love our baby beyond words, my wife and I both want to pursue careers that are crucial not only to our income but to our sense of fulfillment and happiness. We also do not want to turn over a tiny baby to full-time day-care with the hope that we will squeak out some "quality time" at night and on the weekends. Unfortunately, we see no ready answers.

Rifkin is a *Computerworld* features editor.

This issue is as volatile as any facing employers today; it hits right at home where our new babies or toddlers or dependent parents live. We do not want to choose between work and family; both are equally important.

The problem is particularly challenging to the high-tech field because this industry is populated with a vast group of child-bearing-age workers, many of whom waited for years to fashion serious careers before plunging into parenthood. These workers are being sandwiched by children at one end and aging parents on the other.

This group is not conditioned for frustration, either. It is a generation that is used to getting what it wants. It is a generation in which a woman's career is equally important to a man's career, and the men are not content to catch a glimpse of baby for an hour prior to bedtime, as our fathers did.

Colliding values

However, these new values run a collision course with the current realities of working life. A recent issue of the *Harvard Business Review* contains an article on the subject and makes the following critical points:

- Our economy needs the most skilled and productive work force it can possibly find in order to remain competitive. (This is more true in high-tech than perhaps anywhere else.)
- That same work force must reproduce itself and give adequate care to the children who are the work force of the future.
- People with children — women especially — often find themselves at a serious disadvantage in the workplace.

The bottom line in the dilemma is this: To accommodate dependent care, U.S. business must change the rules that have governed work life since the advent of the industrial revolution.

To our industry's credit, the corporate leaders in this movement include many high-tech companies. Hewlett-Packard Co. pioneered the concept of flex time, IBM introduced child-care and elder-care assistance programs, DEC and AT&T have instituted extended-leave policies with guaranteed jobs upon return. SAS Institute, the software maker, has on-site child care. According to the *Harvard Business Review* article, SAS reports that its turnover rates are less than half the industry average and believes the center's extra expense is justified because it decreases the extremely high cost of training new workers.

Unfortunately, not everyone is lucky enough to work for an enlightened employer. In the pressure-packed world of information systems, flexibility for child care is often a foreign concept. Long hours and high tension mark the profession, especially in an era when chief executive officers are demanding visible payback for their information systems spending. IS leaders are mostly men in their 40s and 50s who followed the *Leave It to Beaver* model: Ward went to work. June stayed home, took care of Wally and the Beaver and wore pearls while cooking dinner.

IS, like all other professions, must face up to reality. Unhappy, stressed-out workers are not productive. Forcing a choice between work and family is a clear formula for high turnover and low productivity.

Ironically, it is technology itself that is opening up options that never existed before to address these issues. Corporations need to institute flex time, job sharing, part-time opportunities, on-site child care and effective referral services for employees and their families.

Why work 9 to 5?

Why must workers show up at 9 a.m. and be visible till 6 p.m.? With high-powered workstations and ever-improving network, technology, meaningful work — particularly IS-related functions — can be done at home or during off-hours.

An employee putting in six hours of quality work from 3 p.m. to 9 p.m. is certainly of more value than one who is constantly late, sick or unhappy because the children are in an untenable day-care setting.

By leveraging technology, IS could also attract far more women to careers in the field, a field traditionally male-dominated. As the work force grows tighter and tighter in coming years, the need to attract new workers will be critical, and IS has the opportunity to lead the way, rather than follow an inevitable trend.

Dependent care is an issue that can no longer be swept under the rug. Business must recognize that it is as crucial as trade deficits and short-term debt.

IBM adds new pricing strategy to IS new year

IBM WATCH

ROBERT P. TASKER

IS managers using the latest IBM mainframe software will be paying more than ever before because of new pricing strategies.

The strategies will increase software costs as a percentage of the annual information systems operating budget by as much as 10% to 15%, beginning next year.

Users can expect to see future software product enhancements linked more closely to hardware than in the past. New versions of software will only run on upgraded hardware with the latest operating systems, and conversely, new hardware purchases will require commensurate increases in fees for running the same software.

Tasker is vice-president of International Data Group's Software Research Group based in Framingham, Mass.

Relatively inexpensive software upgrades will become impossible to obtain. Instead, upgrades will be used to actively encourage users to install IBM's strategic products.

The new strategies were initiated as a result of an IBM study that concluded that while IS shops were paying $12 million to $15 million for a leading-edge hardware configuration, they were only paying up to 5% of that cost annually for the latest software.

Some users had also reduced their software expenses by taking advantage of test allowances, a six-month free trial offered by IBM for unusual applications.

To be fair, IBM's software license fees had not substantially increased over a long period of time. By continuing pricing practices that harked back to a time when software was considered no more than a loss leader used to close big-iron sales, IBM was missing a revenue opportunity.

Despite the inevitability of the price increases, IBM will face the difficult problem of repositioning the value of the software products and re-educating senior purchasers within the IS community to the new reality.

> USERS OF IBM and plug-compatible mainframe hardware can well expect additional "indirect" software price increases in the coming years.

In an initial effort to handle this tricky task, IBM eliminated initial license fees for almost all of its software products. The company concurrently established monthly license charges.

While this move gave the appearance of lowering costs, the majority of users experienced increases in the overall cost of software. For one multibillion-dollar manufacturing firm in New Jersey with an IBM 3090 Model 200E installation, the annual cost of software license fees increased by more than 11% for 1990. The elimination of the up-front initial fees was visible — the overall increases were not.

While it minimizes negative publicity, this subtle form of price increase is not helpful to IS managers who must explain why the software they are using costs more than it did last year. IBM would do better to tell users up front that they will pay more overall for software.

Further evidence of the impact of the new pricing strategies is the latest release of IMS (Version 3.1), the database management system. As an example of the increased linkage between software and hardware upgrades, the new IMS release runs only under the MVS/ESA operating system, which runs only on E-class machines and higher. If a user is currently on an older machine (say, a 3090 base model), then both a hardware and an operating system upgrade is required to install the latest version of IMS.

Users of IBM and plug-compatible mainframe hardware can well expect additional "indirect" software price increases in the coming years in two main forms. First, there will be more mainframe models (16 new models were recently added with the Js and JHs). Second, this proliferation of models will lead directly to more model groupings, which will follow IBM's philosophy of "bridging and growing" the customer up the product line. The more model groups, the more opportunity to tier software (and hardware) prices.

The real heart of the problem for IBM continues to be how to increase the percentage of software revenues per account while keeping the customer just happy enough to avoid migration to a competitor's platform. The problem for IS managers who want to stick with IBM will be how to pay for it.

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SOFT TALK

J. A. Savage

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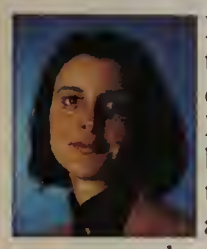

I'm beginning to feel as if I'm caught in a foxhole between blasts from the tobacco industry and the surgeon general.

"Smoking is not proven to cause cancer . . . "

"Of course it is, nicotine brains, you just ignore the studies that are detrimental to your income . . . "

Perhaps we are uptight about all this world's hazards, but those lobbying for protection against VDT electromagnetic fields may have hit that paranoid chord in most of us.

Face it: There is no conclusive proof that VDTs can cause adverse health effects, and there never will be. Vietnam veterans have been trying for more than a decade to prove that the Agent Orange herbicide caused sickness and birth defects in their families. They can't. For every study produced by the veterans, there is another, contradictory one funded by the U.S. government and chemical companies. Similarly, tobacco companies will never, ever admit to a nicotine-addicted public that smoking causes lung cancer.

Continued on page 30

Workstations drawn more toward SAA

BY ROBERT MORAN
CW STAFF

Users and analysts viewed IBM's announcement of CICS OS/2 Version 1.2 last month as the first cooperative processing workstation for applications development under the firm's Systems Applications Architecture (SAA).

"This is the first cooperative processing workstation and the first thing that IBM has to begin tying all the SAA pieces together," said Richard Finkelstein, president of Performance Computing, Inc. in Chicago. He added that CICS, the most widely used mainframe teleprocessing monitor, will be a significant addition to the language and databases that will run under OS/2.

According to IBM, CICS OS/2 Version 1.2 will support the SAA Dialog and Presentation interfaces and enable users to build cooperative processing applications between CICS systems.

CICS support

Under the SAA banner, the new release supports the C language for CICS application programming and direct access from both CICS Cobol and C programs to the common user access (CUA) interfaces in the Presentation Manager and Dialog Manager.

The software carries a one-time charge of $708 and is slated for Feb. 23 availability.

Vince Hilly, director of data administration at Depository Trust Co. in New York, viewed the announcement as another incentive to look seriously at the merits of IBM's Personal System/2 as a cooperative processing workstation.

"We will look at the PS/2 as a platform to start developing applications," Hilly said. "We won't have to keep upgrading our test and production frames on the mainframe."

Peter Kastner, vice-president of the Aberdeen Group, a consultancy in Boston, said, "The ability to write code, format it and do some checkout down on the PC has an enormous attractiveness and offers self-evident benefit."

Hilly said that he viewed the announcement as "another IBM step in getting as much as possible on the workstation level."

With the announcement, IBM is introducing peer-to-peer communications using the LU6.2 protocol between programmable workstations as well as CICS on the mainframe. In turn, according to Finkelstein, users can write programs on the mainframe to access both DL/1 under IMS and DB2.

When the new software is released, IBM will not yet offer cooperative processing for the OS/2 Extended Edition 1.2 database manager.

In March, however, IBM is expected to deliver the OS/2 Extended 1.2, which Finkelstein said will contain the application programming interfaces that will further extend cooperative processing to either the OS/2 data manager or to the mainframe.

The new CICS OS/2 can also run under the DOS operating systems using the Netbios protocol. With DOS, organizations can route transactions and ship functions over the LAN but will not have peer-to-peer communications.

Businesses map a path to profit

BY MARYFRAN JOHNSON
CW STAFF

Federal Express Corp., L. L. Bean & Co. and The Coca-Cola Co. are sold on them.

So is the Delaware bank that uses one to give its executives current market information, and the Ohio hospital that now tracks which doctors refer the most patients.

What these and hundreds of other private businesses have discovered is the competitive value of geographic information systems (GIS), a venerable old technology once confined to natural resource mapping by oil and gas companies.

Today, the popularity of powerful desktop and personal computer systems — already in place at many businesses — and the increasing availability of highly specialized personal computer software for a market once exclusively held by minicomputers and mainframes is slowly changing the face of GIS in the commercial world.

Not quite up, but coming

Combining mapping capabilities with database analysis, a GIS can be used for demographic market analysis, delivery service dispatching, property management, distribution channel tracking or mailing-list selection.

"Everyone says the commercial arena [for GIS] is up and coming, but it isn't quite there yet," said Robin Brown, an industry analyst with Daratech, Inc. in Cambridge, Mass.

At a GIS convention in Orlando, Fla., two weeks ago, Brown noticed a vacuum in the GIS market: the lack of enough consultants and support services.

"Because there is so much software out there now and the sales need such a high degree of implementation, software vendors can't give customers all the support and help they need," Brown said.

Still, the technology is spreading — particularly in sales and marketing departments at companies such as Coca-Cola, where mapping software is used to track competitors.

Continued on page 30

Inside

- Ross Systems and Smartstar form partnership. Page 31.
- University of the Pacific stays true to Unisys in the end. Page 29.

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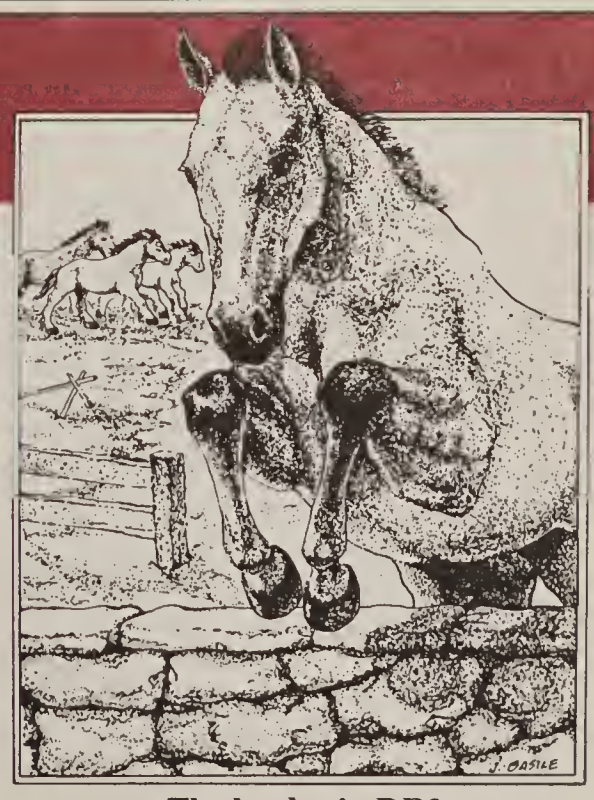

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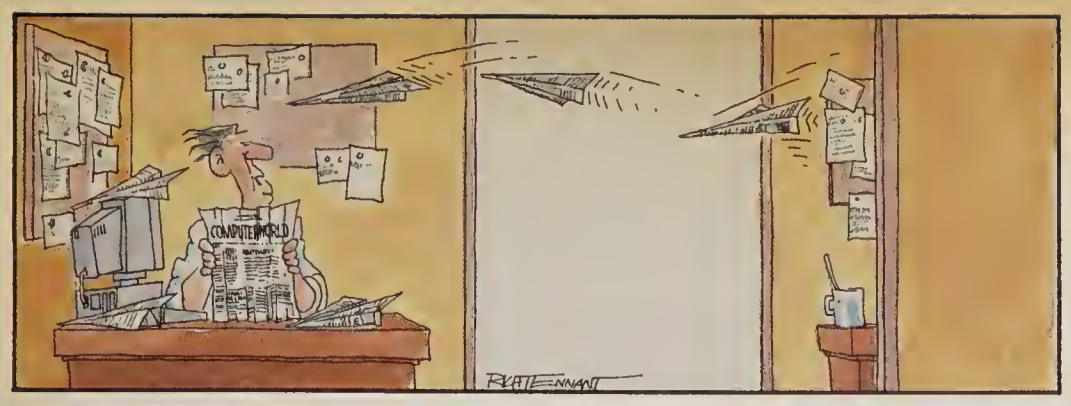

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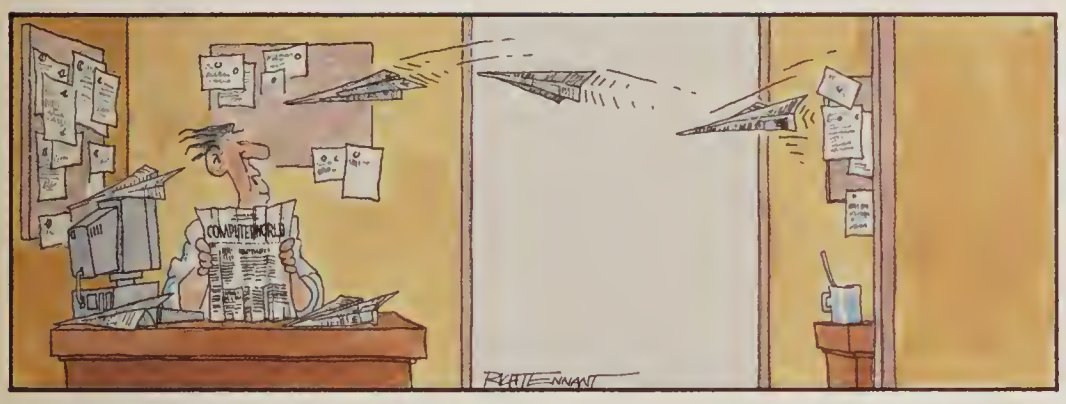

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SOFT TALK

T. Capers Jones

Five steps to software success

As computers and software continue to expand into consumer product areas, companies must recognize that success in software is on the critical path to corporate survival.

The future success of the U.S. against global competition requires the chief executive officers of U.S. industries to understand the true factors of global competition in the 21st century, especially the role of quality as the dominant force in high-technology products and the computers and software within them.

Quality must start at the top and become part of the U.S. corporate culture, and U.S. CEOs and senior executives must stop being part of the U.S. quality problem.

By the end of the 20th century, two new business laws will likely drive successful businesses and industries into the 21st century:

- Law 1: Enterprises that master computers and software will succeed; enterprises that fall behind in computing and software will fail.
- Law 2: Quality control is the key to mastering computing and software; enterprises that control software quality will also control schedules and productivity. Enterprises that do not control quality will fail.

To achieve leadership in software quality control, corporations must follow five steps that have been observed in the

Continued on page 31

U. of Pacific learns a real lesson

True-blue Burroughs shop dallies with IBM, then goes back to its roots

ON SITE

BY JEAN S. BOZMAN
CW STAFF

STOCKTON, Calif. — This is the story of a Burroughs Corp. shop that stayed true to its school, even after it went to IBM.

It was with great fanfare that the University of the Pacific, the oldest private college in California, converted from an aging Unisys Corp. B 6700 to a spanking new IBM 4381 Model 12 in March 1986. But information systems managers at this 3,800-student private college held on to the tapes that had been used during the B 6700's 12 years on campus — just in case. Still, they could not be blamed for clinging to the past; they had been using Burroughs equipment, and then Unisys computers, since 1970.

Springer *put his job on the line*

"We never threw out the Unisys source tapes, because we did have to go back to run off reports," said IS director Jerry Springer. The university ran the 4381 and B 6700 in parallel for nearly two years while programmers converted applications from the Burroughs system to the IBM system. Even later, the campus accountants needed older administrative and budgeting information preserved for later reference, he explained.

"We ran the tapes over at the local junior college, which had a B 6800," Springer said. Similar backup arrangements are more problematic with IBM equipment, he said, adding: "Your backup machine has to be configured exactly the same as your home machine before you can generate the system."

The IBM 4381 also ran an online service for academic end users under the VM operating system, which contributed to performance degradation. But a cutover to the IBM 4381 was forced in August 1988 when the B 6700 died. Technicians could not revive it, even with recycled parts, Springer recalled.

With only one machine bearing the school's processing burden, the 4381 gradually became overtaxed. "Based on IBM's own formulas and on our projected growth rate, we would have been out of capacity on our IBM 4381 by that summer [of 1988]," Springer said.

Still, IBM's proposal of a new IBM 3090 Model 150 did not sit well with Springer, who believed that operating costs were greater with the IBM equipment than with the Unisys machines. He found that he needed more staff, including a systems analyst, than he did with Burroughs.

The big chance

By the end of 1988, when college administrators decided that the IBM 4381 had to be upgraded — possibly to the low-end IBM 3090 — Springer decided to put his job on the line. He told the school's board of regents that converting back to Unisys A series machines would save the campus $1 million over a five-year period, even though it meant an initial outlay nearly that high for new Unisys equipment. He personally promised the president that he could deliver the conversion back to Unisys within budget and on time.

Based on Springer's analysis, the university purchased dual A6 machines and two Unisys Micro-A development systems, which were recently installed. A final cutover from the IBM 4381 is expected in early 1990. The move back to Unisys was also found to reduce the need for mass storage from 17.5G bytes to just 7.5G bytes of disk capacity. "The Unisys operating system and the DMS II DBMS are just more efficient than the IBM systems," Springer said.

In the end, saving the tapes meant that some of the applications from the earlier B series machine are running without change on the new A6 systems.

Across San Francisco Bay, the university's School of Dentistry in San Francisco is also staying true to Unisys by running a compatible Unisys A series shop. In the fall of 1988, the dentistry school installed a single A6 as an upgrade to a 10-year-old Unisys B 1955 machine, said Joseph M. Kaiser, director of information systems there.

The dentistry school's A6 machine supports a database, written with Unisys' Linc fourth-generation language, that tracks all clients at the school's outpatient dental clinics. The same cabinet-size computer contains all student grades and financial records. Only the payroll is sent to the main campus in Stockton for processing.

The University of the Pacific's preference for Unisys systems can be explained by cost-effectiveness — and by familiarity on the part of longtime Burroughs users. "Burroughs, and later Unisys Corp., set up their small systems to run in small shops," Kaiser said, noting that the main campus has an IS staff of 16, and the school of dentistry has a staff of six.

HARD BITS

IBM's bilingual hi-tech

IBM said it will invest $30 million to launch the Language Technology Center in Spain. The center's purpose is to push the development of language technology in Spanish. The focus will be on speech-to-text and text-to-speech conversion as well as the creation of computerized dictionaries.

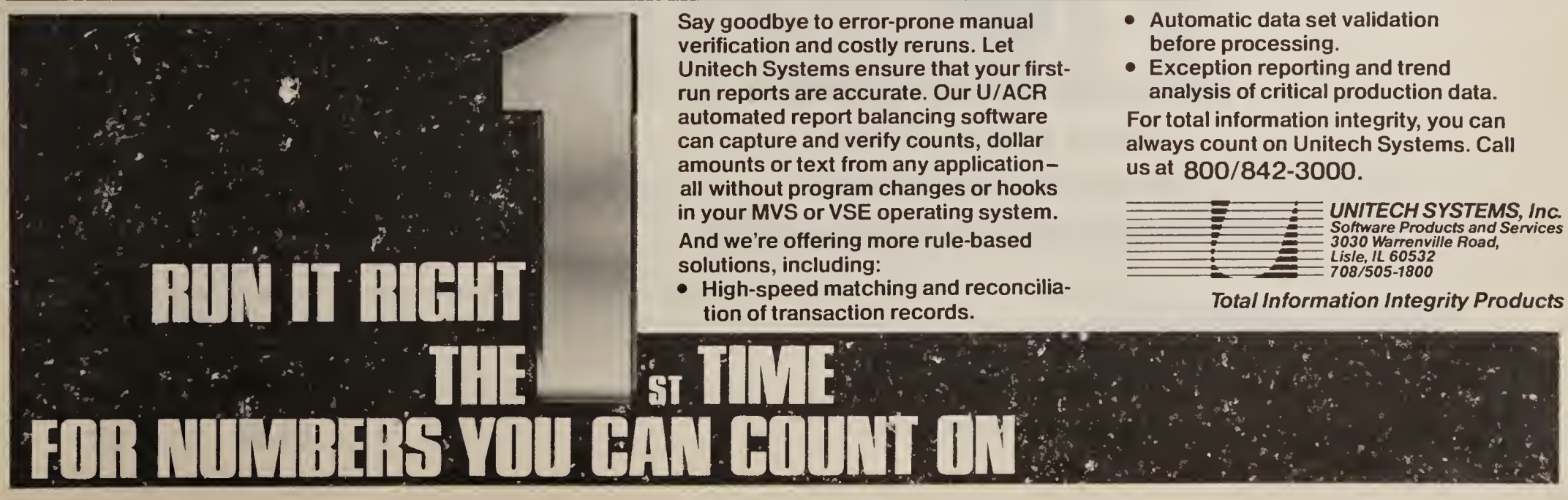
Declaring its "long-term commitment" to the geographic information system (GIS) industry, **Data General Corp.** recently garnered its first GIS applications for reduced instruction set computing-based Aviion workstations and servers.

The **Environmental Systems Research Institute** (ESRI) in Redlands, Calif., a leading GIS vendor, announced that it will port its Arc/Info software to the Aviion platform.

Separately, DG and **Cincinnati Bell Information Systems** signed an agreement to market systems for computer-aided acquisition and logistics support (CALS), a U.S. Department of Defense initiative. Cincinnati Bell will port its own software and third-party software to the DG Aviion platform and sell the systems as a CALS package.

Oracle Corp. and **Stratus Computer, Inc.** have inked a strategic marketing and technology-sharing agreement under which the Oracle Version 6.0 relational database management system and the transaction processing option will be made available on the Stratus XA 2000 family of fault-tolerant computers.

The agreement is an extension of a 4-year-old marketing pact through which Stratus sold earlier versions of Oracle. However, this agreement also provides for Oracle to sell a Stratus XA 2000 version of its DBMS. Previously, Stratus bore responsibility for implementing and supporting Oracle on its systems.



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Path to profit

CONTINUED FROM PAGE 25

Research firm Dataquest, Inc. in San Jose, Calif., pegs the overall computer-aided mapping business at $592 million in 1989 sales. The PC-based share of that market is expected to grow by 22% in the next three years to $222 million annually.

Both Federal Express and L. L. Bean plan their distribution and delivery routes with mapping systems from Strategic Mapping, Inc. in San Jose, Calif.

"The trend is toward more specialized applications that strip out the mumbo-jumbo and put [GIS] into the language of the vertical market," said Todd Everett, vice-president of marketing for Strategic Mapping. "A really hot area right now is in customer information files. With a GIS and an internal database, you can see on a map just where your customers live and what percentage of the market share is yours."

With the release of the U.S. Census Bureau's new computerized boundary files of every county in the nation, businesses can obtain digitized data with more ease and less expense than in the past.

"Smaller organizations don't really need precise, extensive data for applications," Brown pointed out. Neither do they need the massive disk-storage capabilities that a full-blown GIS requires, she added.

The Good Samaritan Hospital in Cincinnati does its strategic planning with Strategic Mapping software and with Mapinfo, a GIS package from Map Info Corp. in Troy, N.Y.

According to hospital planning assistant Jeff Smith, the ability to graphically display patient demographics is boosting the private hospital's marketing efforts and his department's speed in producing target market maps. The Mapinfo software enables the hospital to search out patterns in patient admissions and track referrals from doctors.

The Bank of Delaware in Wilmington began using geographic information three years ago "to present a lot of information in readily digestible form" to bank executives throughout the bank's 33 branches, said Pat Van Catledge, assistant vice-president for marketing research.

Savage

CONTINUED FROM PAGE 25

So why shouldn't VDT manufacturers follow the lead of companies whose products are under suspicion? Think "lite" VDTs, "filtered" VDTs and "menthol" monitors. Users can be macho and keep their old monitors, or they can try a lite version, just in case.

If IBM is any indication, vendors may be catching on. The firm recently brought to the U.S. a VDT called Infowindows, which is said to block some electromagnetic radiation. The product was first marketed in Sweden, where purchasing guidelines require such shielding for government contracts.

Some vendors have a limited solution — screens that are said to drain off static electricity and thus lessen the electromagnetic field from the VDT's screen.

However, the front of a VDT is only part of what user advocacy groups such as Nine to Five, the National Association of Working Women, are worried about. Some studies indicate that radiation leaks from the sides and back of the monitor, so placement in an office could affect the amount of radiation one receives.

That brings me back to studies. Depending on which one you believe, rats and chickens are, and are not, affected by electromagnetic fields such as those found around VDTs. The Computer and Business Manufacturing Association cites a recent study to back vendors' claims of "no problem." Vendors are also waiting anxiously for a study out of the National Institute for Occupational Safety and Health (NIOSH), which they expect will state that VDT radiation is not hazardous.

Their opponents, such as Louis Slesin, editor of the newsletter "VDT News," claim the NIOSH study has been so emasculated that it proves nothing.

Lately, studies have been about real people and electromagnetic radiation. Just last week, one funded by the Department of Energy suggested that low-level fields, such as VDTs and hair dryers, may have more influence on behavior and health effects than high-level fields, such as transmission lines.

And there was another study out late last month on telephone workers exposed to electromagnetic fields who showed exceptionally high rates of cancer.

I'm the last one to advocate a return to manual typewriters, or manual most anything, for that matter, but I read these studies. And they bother me.

For every study that says some aspect of modern life is bad for you, there's a Dr. Ames out there who says, "So what. Peanut butter will kill you." I'll risk the peanut butter.

Savage is a *Computerworld* West Coast senior correspondent.

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Jones

FROM PAGE 29

course of software management consulting in leading firms:

• Step 1. Establish a software quality metrics program. Software achieved a notorious reputation during the first 40 of its 45-year history as the high-technology occupation with the worst track record in terms of measurements. During the last five years, improvements in measurement technology have enabled leading-edge companies to measure both software quality and productivity with high precision.

Leading firms within an industry have full-scale measurement programs that give executives early warnings and the ability to cure problems. Enterprises that do not have software measures have virtually no ability to apply executive control to the software process.

• Step 2. Establish tangible executive software performance goals. Does your enterprise have any meaningful software quality or productivity goals operational? Leading-edge companies do. Since the two key aspects of software quality are defect-removal efficiency and customer satisfaction, reasonable executive targets would be to achieve higher than 95% efficiency in finding software bugs and higher than 90% "good or excellent" customer satisfaction ratings.

• Step 3. Establish meaningful software quality assurance. U.S. companies that concentrate on software quality have higher productivity, shorter development schedules and higher levels of customer satisfaction than companies that ignore quality.

Since the steps needed to achieve high quality include both defect prevention and defect removal, a permanent quality-assurance organization can facilitate the move toward quality control. Quality circles may also be established given the appropriate enterprise culture. This is an area in which enterprises need very strong internal capabilities and should use consulting organizations only during start-up.

• Step 4. Develop a leading-edge corporate culture. Human activities have a cultural component as well as a technological component. The companies that tend to excel in both market leadership and software engineering technologies are those whose corporate cultures reflect the ideals of excellence and fair play. If your corporate culture stresses quality, service to clients, innovation and fairness to employees, then there is a good chance that your enterprise is an industry leader. If your corporate culture primarily stresses only schedule adherence or cost control, as important as these topics are, you may not ultimately succeed.

The CEO and senior executives are the only people who can forge a corporate culture, and it is their responsibility to do it well. If the top is not interested in industry leadership or doesn't know how to achieve it, then the entire enterprise will pay.

• Step 5. Determine your software strengths and weaknesses. More than 200 different factors can affect software productivity and quality, including the available tools and workstations, the physical environment, staff training and education and even compensation plans.

As the 20th century draws to a close, the enterprises that can master computing and software will probably be the key firms of the next century. Those that don't master computing and software may not survive to see the next century!

Jones is chairman of Software Productivity Research, Inc., a Cambridge, Mass.-based consulting firm.

SOFT NOTES

Ross, Smartstar pair up for development

Two vendors that offer Digital Equipment Corp. software products, **Ross Systems, Inc.** and **Smartstar Corp.**, have announced a strategic partnership. Under terms of the agreement, the firms will pursue cooperative marketing and product development for Smartstar's fourth-generation language and development environment, as well as Ross' line of financial packages and other applications.

Within the first quarter of 1990, Smartstar, which is based in Goleta, Calif., will begin marketing user interface software programs that can be applied to Ross files. Ross customers will be able to transfer application data from the DEC VAX RMS database system to VAX RDB/VMS using Smartstar's application tools.

Smartstar's DEC product allows customers to use multiple database management systems simultaneously, allowing migration from RMS, Oracle Corp. and other database systems to DEC's RDB.

Avail Technologies, Inc., an Irvine, Calif.-based maker of VAX/VMS system management software, announced the release of what it said is the first leasing option for VMS system software. Under the "Flex-ability" program, customers can lease Avail's Ability VMS for 12-, 24- or 36-month periods. Rates vary depending on length of term and amount of purchase.

J. D. Edwards & Co. last month began shipping the JDE Form 400, Adobe Systems, Inc.'s Postscript-based forms software for the IBM Application System/400. The Denver-based supplier of accounting and distribution software obtained the software package as part of a strategic alliance with Creative Laser Systems, Inc. in San Mateo, Calif. JDE Form 400 will cost between $4,000 and $12,000, depending on the size of the AS/400.

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Lynx Real-Time Systems, Inc., located in Campbell, Calif., and Data General Corp., based in Westboro, Mass., have reached an agreement to create a Lynxos real-time operating system to run on the DG Aviion line of AT&T Unix System V-based workstations, servers and multiuser systems.

According to the vendors, the operating system software will give Aviion users the option to run real-time applications as well as existing Unix software packages. The new version reportedly will include support for X Window System and Network File System as well as all existing DG/UX products.

Pricing ranges from $2,500 to $15,000, depending on system size and configuration.

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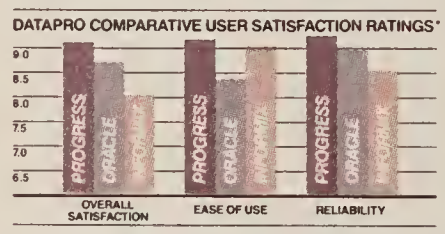

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Legent Corp. has announced Release 2.5 of Automate/XC, the personal computer-based component of the company's Automate/MVS host-based automation product.

The latest version reportedly provides automation capabilities for all major IBM operating systems, including MVS, VM and VSE, as well as for such non-IBM systems as Digital Equipment Corp. VT-100-type environments. The product will run in any environment that is accessible through asynchronous support, the firm said, and will manage messages, issue commands and automate several procedures, such as the IPL/IML process. It runs on IBM Personal Computers, Personal System/2s and compatibles. Lease pricing starts at $2,000 and is based on CPU class.

Legent
8615 Westwood Center Drive
Vienna, Va. 22182
703-734-9494

An image-analysis system created to interactively manipulate satellite image data has been announced by Stardent Computer, Inc. and PCI Remote Sensing Corp.

Under a joint development project, the companies have ported PCI's Easi/Pace remote-sensing image-analysis software to Stardent's Trident graphics supercomputer. The supercomputer reportedly uses 64-bit parallel/vector architecture to provide a peak processing rate of 64 million floating point operations per second. The system also features an aggregate bus bandwidth of 256M byte/sec. and up to 128M bytes of 16-way interleaved memory.

The Titan is available in versions with one to four processing modules and is priced from $55,000 to $105,000. The PCI Easi/Pace modular software is priced from $10,000.

Stardent Computer
880 W. Maude Ave.
Sunnyvale, Calif. 94086
408-732-0400

Database management systems

Data Base Architects, Inc. has unveiled a program designed to provide IBM's DB2 with text-management capabilities.

Online Reference allows users to write business policies into the database, the company said, and searches may be initiated by topic name or partial topic name. A table of contents and an index are included, as well as bookmarking and related-topic linking capabilities. The software runs on IBM MVS and costs $25,000 to $35,000 per CPU.

Data Base Architects
980 Atlantic Ave.
Alameda, Calif. 94501
415-521-7300

Oracle Corp. has extended its SQL*Connect family of gateway products with the addition of SQL*Connect to RMS.

The product was designed to link the Oracle relational database management system to RMS, the file system native to Digital Equipment Corp.'s VAX/VMS computers. It allows

Continued on page 35

Continued from page 34
users to query existing RMS data using standard SQL commands, the company said, and gives RMS complete control over the migration from RMS files to Oracle.

Production shipments are scheduled for the first quarter of 1990, and pricing will range from $2,400 to $95,500, depending on DEC VAX model.

Oracle
20 Davis Drive
Belmont, Calif. 94002
415-598-8000

Development tools

On-Line Documentation, Inc. has announced a new version of its on-line CICS debugging system.

Called Raid, the product was developed specifically to eliminate Cobol bugs in a system and allows the programmer to view each Cobol statement as it is executing, according to the firm. Version 2.3 includes variable mapping, core display, stop paragraphs and search features. A single CPU permanent license for VSE is priced at $4,955, and an MVS license costs $6,995. Multiple-site discounts are available.

On-Line Documentation
Suite 436
20503 Yorba Linda Blvd.
Yorba Linda, Calif. 92686
714-970-6124

Tom Software, Inc. has enhanced Speed II, the company's fourth-generation language application development tool for the Wang Laboratories, Inc. VS operating environment.

According to the company, Version 5.04 supports as many as 1,000 devices and also offers an improved interface to Wang's WP Plus program. Pricing ranges from $1,800 to $180,000, depending on VS configuration, number of users and the number of application designers accessing the system.

Tom Software
P.O. Box 66596
Seattle, Wash. 98166
206-246-7022

A software package that creates automation rules programs for data centers operating in an IBM MVS/XA or MVS/ESA environment has been announced by MVS Software, Inc.

Called Easyrule, the product is reported to be an enhancement feature available in Release 1.43 of the company's OPS/MVS fourth-generation language for data center automation. It is available for both JES2 and JES3 sites. The enhancement is available at no extra charge, and no separate installation is required.

MVS Software
Suite 221
12555 W. Jefferson Blvd.
Los Angeles, Calif. 90066
213-578-1147

Utilities

Isogon Corp. has announced another version of Spiffy, its enhancement software for IBM MVS ISPF/PDF 2.3 or 3.1 environments.

The product was designed to make ISPF more consistent and powerful, the vendor said, and Version 2 includes a member list handler to make member selection list processing much faster than under native ISPF. License fees are based on CPU model, and a perpetual license is priced from $8,000 to $16,000. The first year's maintenance is included.

Isogon
330 7th Ave.
New York, N.Y. 10001
212-967-2424

Two software packages for IBM mainframes running under MVS or TSO/ISPF have been announced by CGCI, Inc.

The first product, Sedit, is reported to be a data-handling facility that allows users to edit any size and any type of file, including VSAM. It includes a Recovery function to undo changes performed in previous edit sessions. Sedit/DB, the second offering, is an IBM DB2 data-handling facility that allows users to create and edit DB2 tables and views as well as issue SQL commands and perform DB2/SQL control functions.

Each package is priced at $9,450 for a perpetual license.

CGCI
8 Place Argonne
Lorraine, Quebec, Canada J6Z 3B9
514-621-4234

Computer-aided software engineering

Meta Systems Ltd. has unveiled a repository-based computer-aided software engineering system that runs on the IBM Personal Computer platform.

Called the Structured Architect Workbench, the software provides systems developers with a proprietary extension of the Microsoft Corp. Windows Multiple Document Interface. The repository can be exported to a variety of minicomputers and mainframes, and features include requirements traceability, analysis and reporting functions, according to the company.

Running on an Intel Corp. 80286- or 80386-based machine, the software requires 1M byte of memory and a hard disk. According to the vendor, Workbench is priced at $6,995, and quantity pricing is available.

Meta Systems
Suite 200
315 E. Eisenhower Pkwy.
Ann Arbor, Mich. 48108
313-663-6027

In the data business, sometimes it's better to mix and match.

At GTE, our data sales specialists and engineering specialists have researched, planned, designed, and implemented literally hundreds of data systems, large and small. Many times, we've found it more efficient to design a network by selecting state-of-the-art components from a variety of manufacturers. We MIX products and MATCH protocols, to meet your needs.

And when you finally make your purchases, our loyalties are with you – not to any particular brand name.

Besides knowledge and experience that span the entire telecommunications industry, GTE offers one distinct advantage. We'll stand behind any data system we sell with our highly trained service staff.

When you're ready to select a data communications system, or upgrade the one you have, do two things.

Forget everything you know about shopping. And call your GTE Account Manager. GTE, the data communications systems integrator.

GTE

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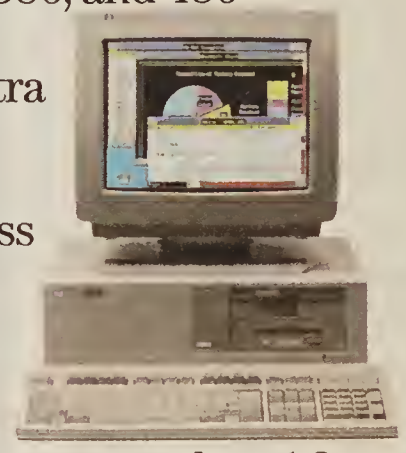

With Intel 286, 386, and 486™-based models, HP's line of Vectra personal computers suits a range of business needs. Vectra PCs easily accommodate expansion. You can get up to 8 accessory slots, 1.3 gigabytes of hard disk storage, and 64 Mbytes of RAM. And all models accept both 5.25″ and 3.5″ disks.

Beyond this, HP's adherence to industry standards ensures compatibility. Now, and into the future.

But the most important feature is one that Hewlett-Packard has offered for 50 years. Exceptional quality. This, along with HP's extensive network of trained, authorized dealers, gives you all the assurance you need.
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CPPCC912

NEW PRODUCTS — SYSTEMS

Data storage

Applied Digital Data Systems, Inc. (ADDS) has introduced an 8mm tape drive for use specifically with the company's Mentor multiuser computer systems. ADDS Mentor computer systems are based on the NCR Corp. Tower platform and use a proprietary implementation of the Pick operating system.

The TP8MM provides as much as 2G bytes of storage capacity on one tape, the vendor said, and is configured with read-after-write capability and an error-correction function. The tape drive is scheduled for delivery in December, and the price for each unit will be $13,250. One year of maintenance is included.

ADDS
100 Marcus Blvd.
Hauppauge, N.Y. 11788
516-231-5400

Ibis Systems, Inc. has unveiled the second product in its line of data storage subsystems for the VMEbus environment.

The Ibis Tristar reportedly offers 2G-byte storage capacity and uses embedded parallel-transfer technology to provide an across-the-bus peak data transfer rate of 30M byte/sec. The subsystem can be used in workstation, supercomputer and minicomputer applications that require large data-storage capacities coupled with high I/O speeds to produce real-time graphics imaging and number-crunching.

Slated for shipment in September, the product is priced at $38,920 in OEM quantities of two to four.

Ibis
5775 Lindero Canyon Road
Westlake Village, Calif.
91362
818-706-2505

Archive Corp. has introduced two 4mm tape drive products based on digital audio tape (DAT) technology.

Aimed at networked and multiuser system platforms, the Python peripheral family reportedly provides 1.3G bytes of data storage capacity on a single DAT cartridge. Both the 4520/21 half-height, 5¼-in. form-factor internal models and the 4330/31 external models incorporate a 3½-in. DAT mechanism combined with an embedded small computer systems interface controller.

The units are scheduled for release in February 1990, and their pricing will range from $1,500 to $1,700 in OEM quantities.

Archive
1650 Sunflower Ave.
Costa Mesa, Calif. 92626
714-641-0279

Power supplies

Alpha Technologies, Inc. has announced two small-footprint, ferroresonant uninterruptible power supplies (UPS) with ratings of 1,350 and 1,500 VA.

The Alpha FR/UPSs reportedly measure 10 by 14 by 23½ in. and were designed to provide four- to six-minute protection in the event of a power interruption or disturbance.

The 1350 model is priced at $2,029, and the 1500 configuration is available for $2,198.

Alpha Technologies
3767 Alpha Way
Bellingham, Wash. 98225
206-647-2360

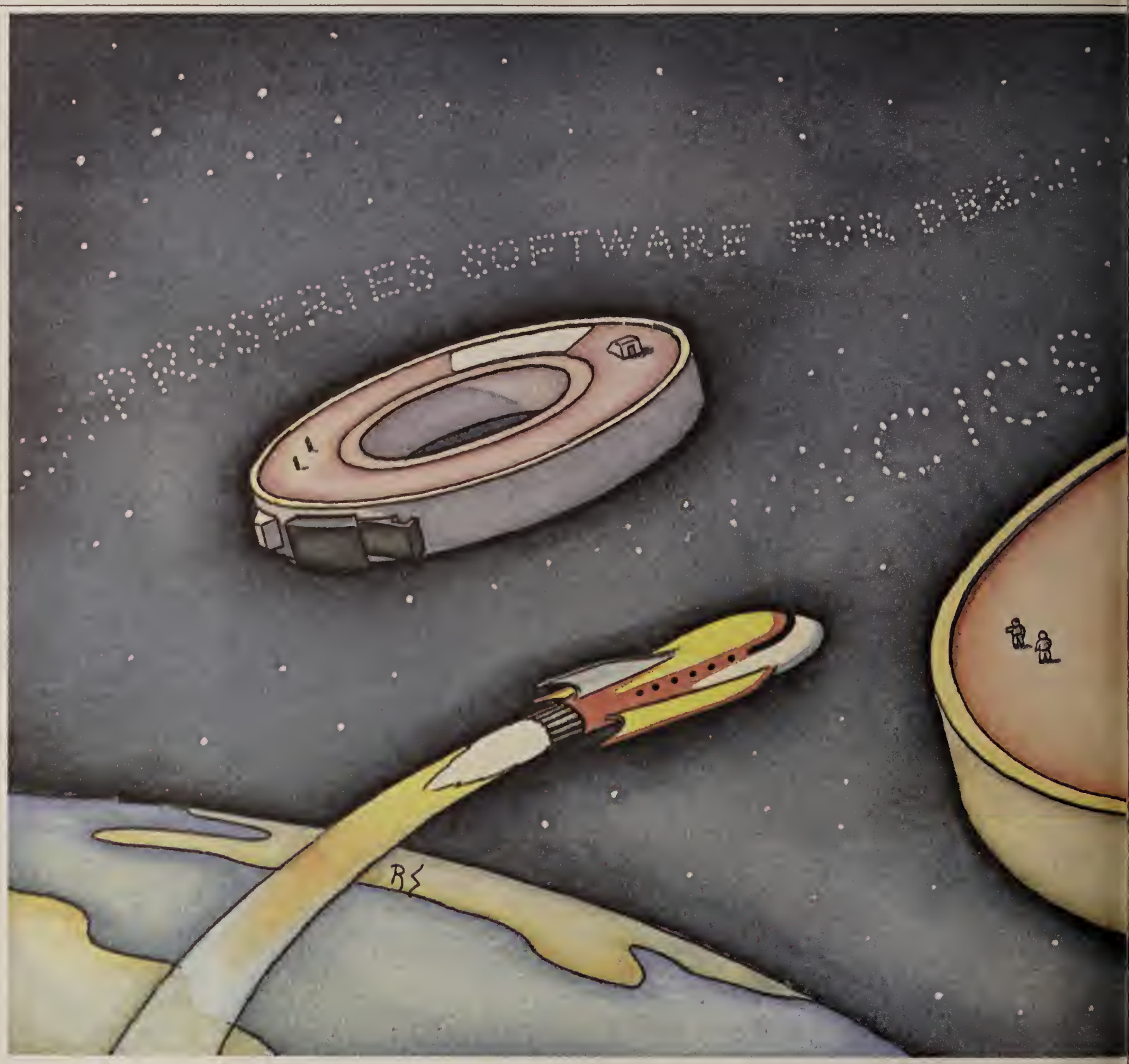
Deltec Corp. has introduced an uninterruptible power supply (UPS) that was designed for use with small, multiuser minicomputers, local-area networks and clustered microcomputer systems.

According to the company, the 2000 series UPS includes an RS-232 communications interface, a remote emergency power-off interface and automatic circuit breakers.

In addition, automatic shutdown and monitoring options are available for IBM's Application System/400.

List pricing for the 2000 series ranges from $3,500 to $5,000.

Deltec
2727 Kurtz St.
San Diego, Calif. 92110
619-291-4211



Soar To New Heights In CICS And DB2 Productivity.

Get off to a flying start with On·Line Software's new CICS Productivity Center and ProSeries Software for DB2.

CICS Productivity Center

CICS Productivity Center was introduced to meet the five most critical needs identified by CICS shops. Unlike other "product integrations" that only offer a superficial main menu that passes control to individual products, CICS Productivity Center gives you true interaction for faster, easier testing and debugging, quality assurance, system stability, application development, data recovery and on-line resource management.

ProSeries Software is a group of products that makes it easier to work with DB2. With ProSeries you can manage DB2 objects without SQL. With its ISPF-like interface, you can test DB2 applications more efficiently. And since it also lets you embed SQL directly into

I/O devices

A wide-format, color electrostatic plotter has been introduced by Raster Graphics, Inc.

The Colorstation D was developed to produce full-color, hard-copy output from computer-aided design applications running on stand-alone or networked personal computers and workstations, according to the company.

The 200/400 dot/in. selectable device offers 256 colors for line drawings and 16 million colors for rendering software. It is available at a list price of $18,500.

Raster Graphics
285 N. Wolfe Road
Sunnyvale, Calif. 94086
408-738-7800

Falco Data Products, Inc. has introduced a family of high-resolution VDTs.

The Infinity series is composed of five 14-in.-display ANSI/ASCII graphics terminals, which reportedly feature a 70-Hz refresh rate and a full 400-line borderless display. According to the vendor, all of the units include the company's Virtual Terminal Windows software for creating as many as six communications windows on the screen with different line and character counts.

Pricing ranges from $595 to $695, and the terminals can be configured with additional serial and parallel ports.

Falco Data Products
1294 Hammersmith Ave.
Sunnyvale, Calif. 94089
408-745-7123

Genicom Corp. has announced the 3600 series, a line of business-class, serial-matrix printers that was designed to provide IBM 4224 coaxial and twin-axial printer emulation, as well as IBM Intelligent Printer Data Stream capability, the company said.

The units offer a 300 char./sec. print speed and include an automatic paper park function. Options include an automatic sheet feeder and field-installable color upgrade kit.

Retail pricing for the 3600 series ranges from $4,200 to $5,190, depending on the model selected.

Genicom
Genicom Drive
Waynesboro, Va. 22980
800-443-6426

The Harris Computer Systems Division of Harris Corp. has announced a graphics subsystem for use with its line of Night Hawk real-time computers.

The Night Hawk GS-1 graphics subsystem consists of a graphics processor board, a 19-in. color monitor, a low-profile keyboard and an optical mouse. Device driver, utility, diagnostic and development software is also included.

According to the company, applications can communicate with the subsystem via an interface with Harris' CX/UX Unix, CX/RT or CX/SX operating systems. Pricing begins at $15,000.

Harris
2101 W. Cypress Creek Road
Fort Lauderdale, Fla. 33309
305-973-5125

QMS, Inc. has launched a 15 page/min. laser printer aimed at industrial graphics, automatic identification and bar-coding applications.

The Magnum LP15 can be configured with IBM midrange systems as well as with a variety of microcomputer, minicomputer or mainframe environments via serial or Centronics parallel interfaces. The unit offers 300 dot/in. resolution and a 25,000-page monthly duty cycle. It is priced from $11,245.

QMS
1 Magnum Pass
Mobile, Ala. 36618
205-633-4300

Matrix Corp. has announced a line of modules for Dbus-68 and VMEbus expansion buses.

Ethernet, small computer systems interface (SCSI)/floppy interface, parallel/serial, serial and combination modules are available.

Prices range from $375 for a serial module to $1,400 for a combination serial/SCSI/Ethernet module.

Matrix
1203 New Hope Road
Raleigh, N.C. 27610
919-833-2000

a TSO CLIST, you'll develop application prototypes and DB2 tools in half the time.

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Introducing the new IBM LaserPrinter: 25% faster printing, advanced features and a revolutionary streamlined design.

A printer that can raise your productivity as much as the new IBM LaserPrinter doesn't come along every day.

Not only does its advanced design make it outperform the HP LaserJet Series II, which up till now has been the benchmark in laser printing. But also, its advanced design gives the IBM LaserPrinter a dramatically new, more space-efficient shape.

Yet with all this, there's one area in which the competition rises above us: their price.

We just advanced the art of laser printing a full 25%. The new IBM LaserPrinter gives you state-of-the-art print quality a full 25% faster than its main competitor.

Why other printers can't follow in our footsteps. The advanced design and engineering of the IBM LaserPrinter give it a footprint that's 33% smaller than its main competitor's. And that 33% gives you more usable workspace.

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an exceptional printer along.

The new IBM LaserPrinter, 1989.

		IBM LaserPrinter	HP LaserJet Series II
Speed	✓	up to 10 ppm	up to 8 ppm
Footprint	✓	291 sq. in.	432 sq. in.
Paper-handling options	✓	500 sheets, 75 envelopes	15 envelopes*
Collates letters/envelopes	✓	yes**	no
Plotter emulation	✓	standard	optional
Resident fonts	✓	10	6
Font card size***	✓	credit card	"8-track" cassette
Standard weight	✓	33 lbs.	50 lbs.
Parts***	✓	400	1000
Dots per inch		300 x 300	300 x 300
Printer emulation	✓	IBM, HP compatible	HP compatible
Printer engine		IBM	Canon
List price	✓	$2,595	$2,695

*HP envelope tray replaces standard paper tray **With paper-handling options ***Approximate

It also takes the lead in paper-handling options by offering automatic collating of letterheads, second sheets and envelopes.** Plus more ample storage capacity.

See history in the making by having your IBM Authorized Dealer or IBM marketing representative demonstrate the exceptional new IBM LaserPrinter. Locate your nearest dealer by calling 1 800 IBM-2468, ext. 194.

The new IBM LaserPrinter.
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But you don't have to worry. Integral knows the score. That's why we'll continue to deliver SAA Financial and Human Resource solutions that make sense for your company's future — not offer software that might be phased out soon due to the financial considerations of a merger.

SAA solutions, not mergers, have made us IBM's premiere business partner and the recipient of their Outstanding Achievement Award for exceptional performance.

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in Canada **415/939-3900**.

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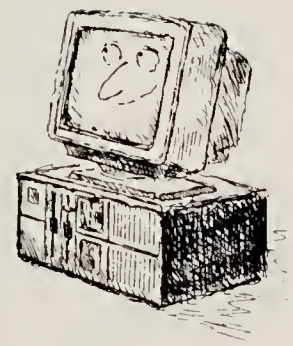
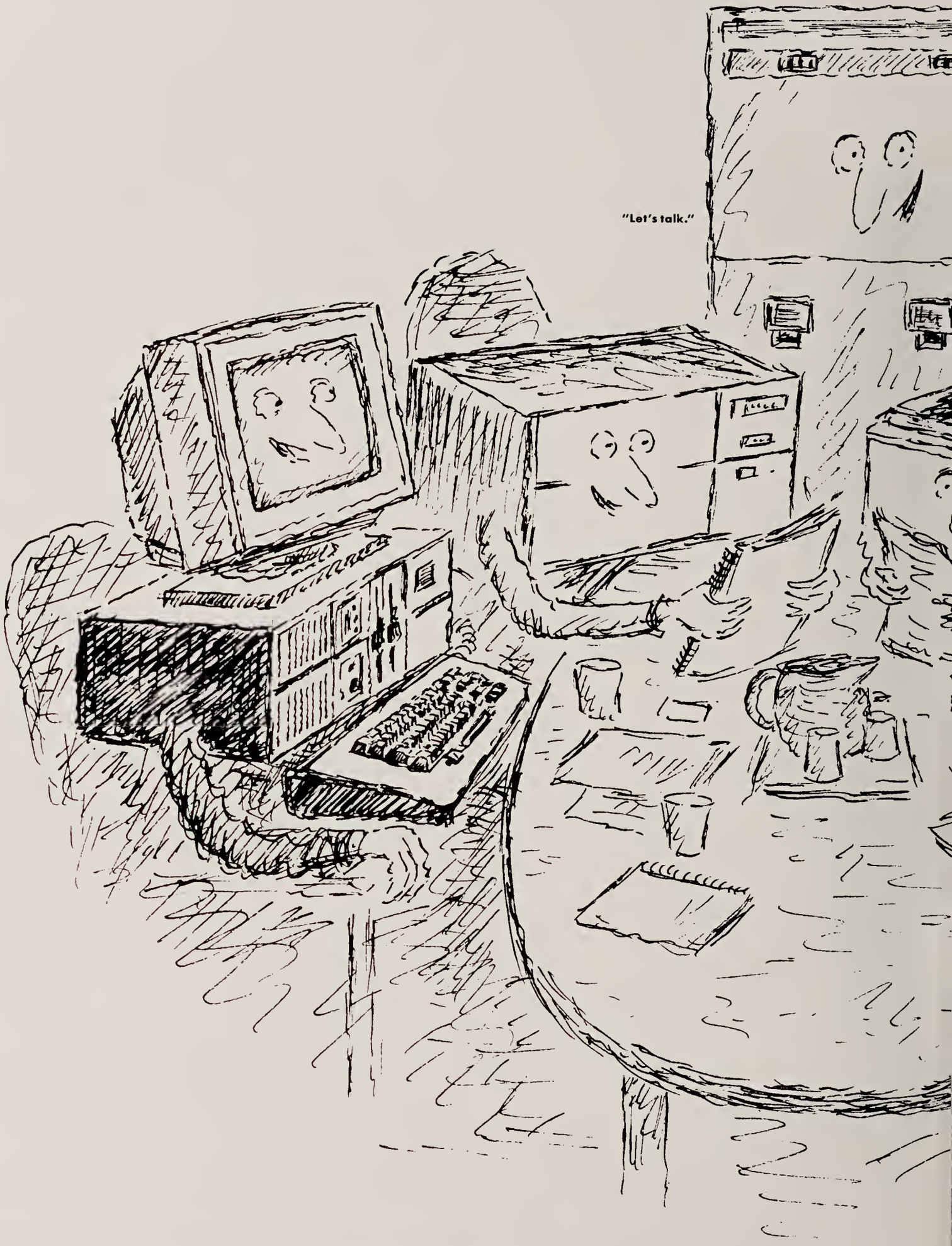
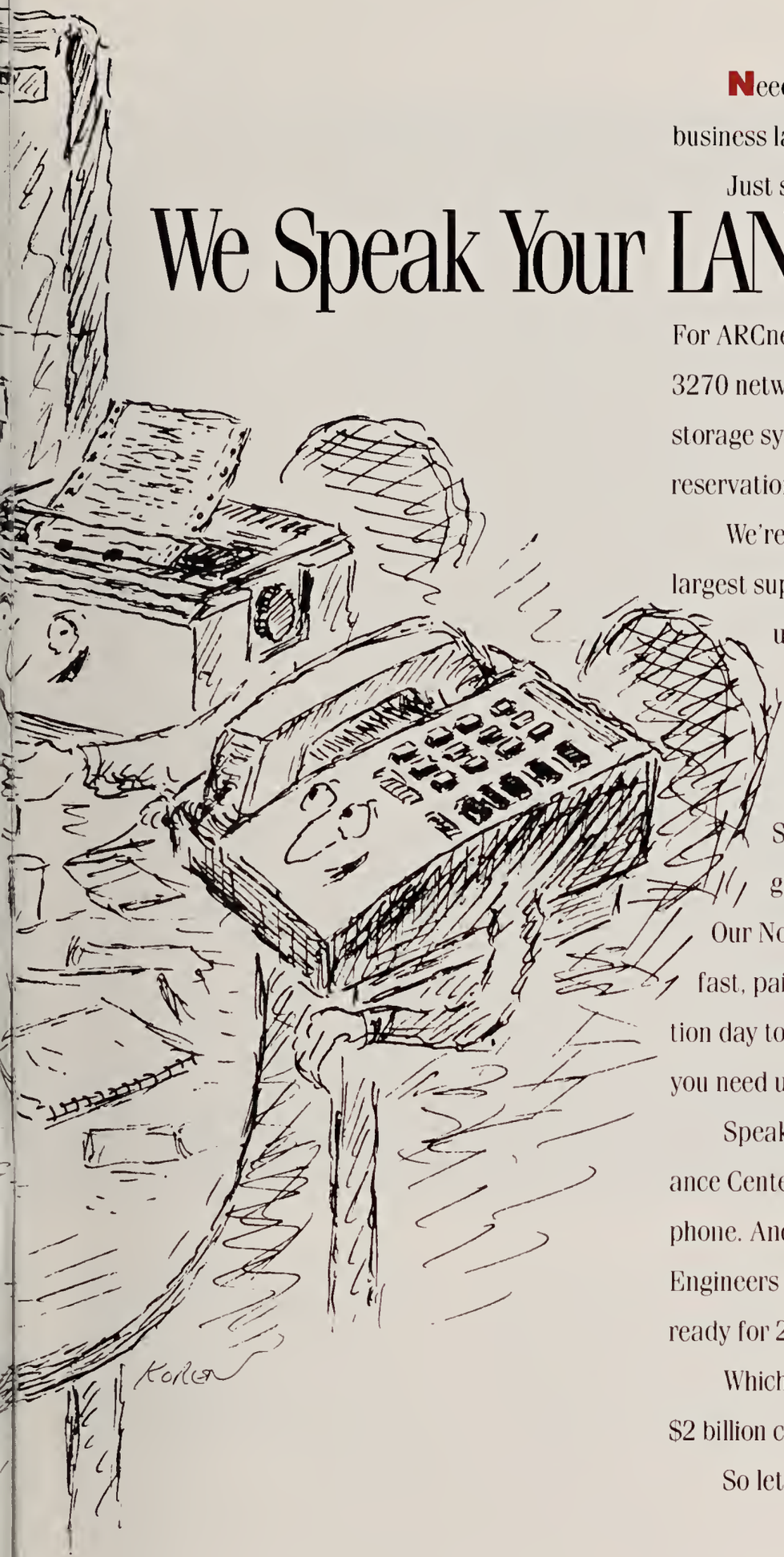


MEMOREX TELEX


"Let's talk."



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7070 NETWORK SERVER

7045 INTELLIGENT WORKSTATION

7040 INTELLIGENT WORKSTATION

Intelligent Systems Series

*The **7045 Intelligent Workstation** gives you full desktop capacity in a smaller package. We integrated video support and diskette control in the base system to give you six expansion slots for a full range of communications or other options. Standard 1MB of RAM and 80286 operation at 8/12MHz or 8/16MHz. The companion **7065** offers 16MHz or 20MHz 80386 microprocessing, making either unit a high-performance solution for a LAN, as a LAN server, or standalone.*

*Powerful performance perfect for the most demanding LAN server and high-end multi-user applications. The 20MHz **7070 Network Server** delivers up to 16MB of RAM with five available storage bays for total flexibility. Effortlessly supports leading network operating systems and can platform complex CAD/CAM/CAE programs.*

*A low-profile but highly-integrated 80286-based workstation. The **7040**'s built-in functionality leads competitors with integrated video and floppy disk support, SCSI fixed-drive interface and a mouse port. Switchable 8/12MHz and three expansion slots make this compact performer readily expandable and adaptable for a variety of applications.*

7025 INTELLIGENT WORKSTATION

Token Ring LANs Ethernet Arcnet

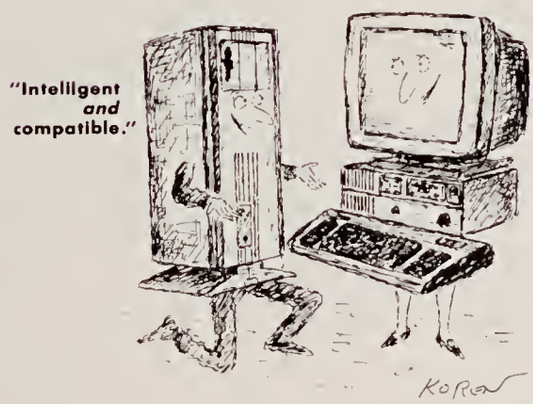
The Memorex Telex Intelligent Systems Series gives you a single source for a complete line of state-of-the-art workstations.

For LANs, WANs, or as standalones. With full connectivity for 3270 and midrange systems. For airlines systems and travel applications, Memorex Telex integrates ALC solutions and customizes them to meet end-user requirements.

We've selected our most reliable plug compatibles. Then increased performance, streamlined profiles and integrated functions, and expanded flexibility to offer you unmatched versatility in systems solutions.

Then you get added value on top of this added value. With expert consultation, design, installation, user training and customized support. All of which makes Memorex Telex the hardware systems integrator you need to speak your LANguage.

The industry standard for packing big 12MHz performance in a small footprint. An excellent solution for both LAN or standalone applications, the ***7025 Intelligent Workstation*** *also features integrated disk and video controllers, providing two expansion slots for add-in adapter boards.*



5460 TAPE CARTRIDGE SUBSYSTEM

3261/81T TAPE SUBSYSTEM

1197-D/W2 DISPLAY STATION

1224 PRINTER SERIES

1197-C2 COLOR DISPLAY STATION

*An ergonomic and highly functional display available with green, amber or black-on-white 15" monitor, the **1197-D/W2 Display Station** is capable of 3,650-character display and split-screen mode. Supports up to three concurrent sessions (two displays and one printer) and 83-, 102- or 122-key keyboards. Features print trim, host-addressable printing and support of twisted pair or twinaxial cabling.*

*The **1224** series of intelligent 4224-compatible desktop matrix printers utilizes the advanced functions of IPDS support such as graphs and barcodes. 256K or 512K memory. Handles 250 or 400 cps in one, four or eight colors and offers versatile paper-handling capabilities.*

*Offering brilliant, two- or seven-color display modes, the **1197-C2 Color Display Station** supports up to three concurrent sessions (two display and one printer) and four terminal modes. Use with 83-, 102- or 122-key keyboards. More features include print trim, host-addressable printing, and support of twisted pair or twin-axial cabling.*

AS/400 is a registered trademark of International Business Machines Corporation.

1196 A/B
DISPLAY STATION

S/3X and AS/400™ ENVIRONMENT

If you're unaware of Memorex Telex's total commitment to midrange users, consider this fact: We offer you the world's most comprehensive line of plug-compatible products for S/3X and AS/400 environments. Period.

That means everything you want, from nobody else.

Personal systems and workstations. Display stations. Impact and non-impact printers. Systems printers. Disk and tape storage devices. Add-in memory and other system upgrades.

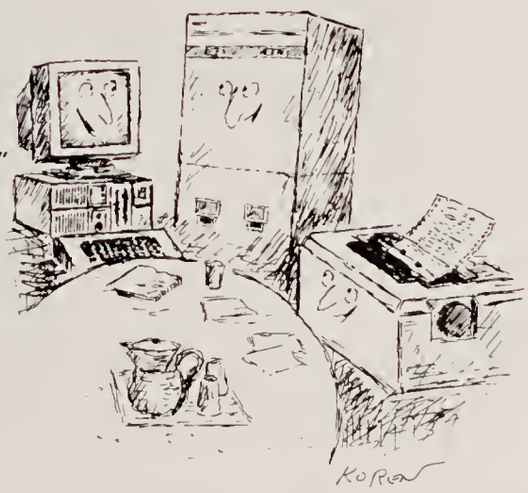
Many we R&D ourselves. Others we OEM-source and enhance. All of them we continually evaluate and upgrade to give you uncompromised quality, reliability and performance. Today, tomorrow, and well into the next century.

Which, for midrange users, is good news in any language.

Introducing state-of-the-art storage that's 100% compatible with the 3480 standard. Configured with an automatic cartridge loader, the ***5460 Subsystem*** *can back up more than two gigabytes of data without operator intervention.*

The ***3261/81T Subsystem*** *is the midrange industry standard for save/restore operations. Fully compatible with 3422 and 3430 tape systems, it offers densities of 1600/6250 bpi with data transfer rates from 200kb to 1250kb per second.*

The ***1196 A/B*** *full-function 12" Monochrome Display Station features a choice of 83-, 102- or 122-key keyboards as well as host-addressable print support. Supports twisted pair or twinaxial cabling.*



3890 DISK DRIVE SUBSYSTEM

6890 SOLID STATE SUBSYSTEM

*The **3890 Disk Drive Subsystem**, our latest generation of disk drives, is an innovative approach to triple capacity. We reduced head disk assembly size to eight inches (from 14") to improve reliability and serviceability. And to offer the industry's best price and capacity per square foot.*

5480/SP2 CARTRIDGE TAPE SUBSYSTEM

Large Storage SYSTEMS

*1Mbit semiconductor storage technology makes the **6890 Solid State Subsystem** high-performance system perfect for critical, frequently-accessed data. Solid state means no moving parts and no seek time. Its thousands of operations per second boost user productivity. Holds both temporary system files and permanent production data.*

Who packs more facts in a square foot than anybody? Memorex Telex.

We pioneered our first disk drive storage unit a generation ago. And each succeeding generation of Memorex Telex devices — from tape to solid state to cartridge robotics — has meant more cost-effective storage, processed faster, easier to expand, and simpler to operate.

All with floorspace savings that crowd neither computer rooms nor budgets.

But hardware is just the beginning. Our Customer Engineers and support teams are peripheral, channel and mainframe-trained. From the first analysis to the last test run, you'll get the seasoned systems service you need in your nonstop, real-time environment.

*We're building on the success and reliability of the **5480 Cartridge Tape Subsystem** with a simple, space-saving idea: stack them! This **5480 Special Package** offers the highest capacity-per-square-foot in the industry, and sets new standards for ease of operation and maintainability. New robotic options vastly increase data handling flexibility and speed.*

"Any questions?"

1174 NETWORK CONTROLLER

1192 ENHANCED FUNCTION DISPLAY

1324 COAX MATRIX PRINTER

*The highly-reliable choice for high volume printing, the **1324 Coax Matrix Printer** is rugged, supports IPDS and is user-friendly. Forms modules make swap-outs fast and keep paper alignment perfect. Handles four- and eight-color printing. Best of all, its LCD message center speaks in English, not cryptic codes.*

*A versatile networking platform in 3270 environments, the **1174 Network Controller** offers user benefits that go far beyond current standards. Supports up to 96 devices and up to four 3270 hosts at once. So you'll get cost savings and greater flexibility in network processing, with 3270 and asynchronous communication combined with Token Ring-based networks. A totally new set of standards for connectivity and networking reliability.*

*With an array of screen sizes, specialized keyboards and a new modular design, the **1192 Enhanced Display** series launches an era of enhanced operator productivity. These displays offer features you can't find on other 3270 products — programmable-base colors, field marking for clear identification of data entry fields, screen sizes up to 132 columns, on-screen calculator functions and local screen print capability for easy deskside copy.*

C19A COMBINED FUNCTION TERMINAL

3270 NETWORKS

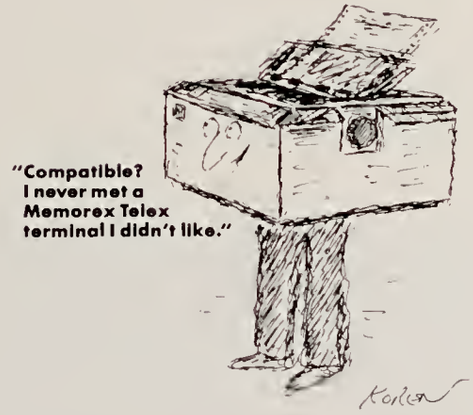
Perhaps nowhere is the Memorex Telex commitment to value-added innovation more evident than in our 3270 market displays, printers and controllers. And no one can touch us.

It's a simple and successful formula: We listen to our customers, anticipate their needs, and deliver solutions. Year after year.

The result is an extensive family of products for the 3270 application environment that creates an industry standard. A complete range of displays, from basic to multi-function. Controllers for simple or advanced networking applications. New laser printers that attach to 3270 controllers, PCs and LANs simultaneously.

All 100% plug compatible. And all 100% conversant in your business language.

*The **C19A Combined Function Terminal** provides desktop automation tools that dramatically enhance operator productivity. This 3270 plug-compatible terminal provides multiple data communications, extensive windowing capabilities, inboard applications and integrated telephone features. That means operators conduct more calls, quickly and accurately update system information and automate repetitive tasks. Nobody combines functions better.*



Memorex Telex is the world's largest supplier of plug-compatible computer products and supplies, and enjoys a proud reputation for innovation in the telecommunication and computer industry worldwide.

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The LANguage Of Business.™

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- ☐ *3270 Network Products*
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- ☐ *Controllers*
- ☐ *Printers*
- ☐ *Other* _____

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COMPANY _____

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CITY _____ **STATE** _____ **ZIP** _____

4343 S. 118th East Avenue
Tulsa, OK 74146
1-800-950-3465

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MICRO BITS

Michael Alexander

Criminal illiteracy?

Computer literacy is often said to be useful to employees interested in moving up through the corporate ranks, but now it looks like it might also be helpful for keeping them out of jail. Just ask Marshall Williams, who contends that his lack of computer literacy may land him in jail with a sentence usually reserved for ax murderers and hit men.

Williams is looking at the possibility of 15 years in jail following his conviction on Nov. 16 for deleting critical financial data and backups stored on his employer's Altos Computer Systems multiuser network. The employer charged that the destruction of files cost more than $400,000 in lost business, plus the time it took to restore the files.

Continued on page 55

Inside

- Mac portable up for review. Page 45.
- Sun tries lighting Sparc in embedded controller market. Page 53.
- Basic image problem. Page 54.

IBM throws PIM into the ring

Personal info manager's graphical interface is grabbing some attention

BY PATRICIA KEEFE
CW STAFF

WHITE PLAINS, N.Y. — IBM's Applications Systems Division's desktop software group recently unwrapped IBM Current, its DOS-based entry into the personal information manager (PIM) market.

IBM hopes to redefine the PIM category by incorporating a graphical user interface (GUI) into Current, which enables users to organize, relate and retrieve text and graphical data. Although the package is customizable, using predefined categories is said to ease training.

The graphical interface has already hooked one large Fortune 50 company. A technology manager there who is beta-testing the product said he preferred it to character-based PIMs, specifically citing Lotus Development Corp.'s Agenda.

An essential GUI

"The GUI is really essential in helping someone use [the software]. I see this product as something very close to what [Lotus'] 1-2-3 was like for spreadsheets. It's the first PIM easy enough to use [so as] to encourage users as opposed to discouraging them," he explained, referencing a built-in tutorial.

At $395, Current is a single-user program that incorporates a runtime version of Microsoft Corp.'s Windows 2.0. Features include word processing, calculations, file transfer and viewing options ranging from a graphical representation of an address book to a Gantt chart.

So far, Current has "helped tremendously" in providing a way for individuals at the firm, who often work with a variety of businesses within the organization, to pull together diverse pieces of information and coordinate tasks with people who are not necessarily working with them, the manager said.

The hypertext feature allows users to link appointments, people and resources, he explained. For example, something appearing in one category that is relevant to another category automatically becomes a connection; the feature is customizable.

This is particularly useful given his descriptor of his company as having highly task-force and matrix-oriented management.

IBM does plan to offer a version for OS/2 Presentation Manager at some point, but the lack of one today has not deterred some large accounts.

"We went to IBM interested in procuring a suite of Windows-based applications and felt that their PIM, coupled with some other tools, was very valuable to us," the Fortune 50 manager said.

Although the company will migrate to OS/2, it has invested in several thousand Intel Corp. 80286-based computers. "I don't see any business incentive to invest several thousand dollars in the hardware [upgrades], software replacements and training needed to go to OS/2," the manager said.

Instead, his company is moving to Windows: "Windows 3.0 is an excellent stepping-stone to OS/2. It provides a cost-effective way to introduce the same GUI that OS/2 users will need."

White Christmas could become dream

ON SITE

BY WILLIAM BRANDEL
SPECIAL TO CW

ANN ARBOR, Mich. — You can kiss that white Christmas goodbye. According to a computer model, in the not-too-distant future the greenhouse effect will reduce snowy winters to a memory and a Christmas carol for most of the Great Lakes states.

This prediction is based on computer-generated output from an atmospheric simulation program built by the National Oceanographic and Atmospheric Administration's (NOAA) Great Lakes Environmental Research Laboratory here.

How soon the heavy damage — shorter winters and longer summer droughts that may result in the Great Lakes shrinking and their shores turning into mosquito-infested mudflats — will hit is yet to be calculated. But as industrial technology drove the world into this mess, NOAA is using personal computer technology today to measure its impact on tomorrow.

The modeling experiment was prompted in June 1986, when the U.S. Senate Environment and Public Works committee requested that the Environmental Protection Agency (EPA) determine the potential effects of global climate change on the U.S.

TOM MONAHAN

While the simulation model stresses the limitations of a polluted earth, the software it uses has found its own wall, running on a tired Digital Equipment Corp. VAX 11/780 for which most of the software was designed. NOAA is now porting the application down to a Intel Corp. 80386-based PC to meet another real-world scenario.

"We want to make this program as portable as possible so other researchers can use it," said Tim Hunter, software programmer at NOAA. This particular global warming software model takes on significance as it

Continued on page 54

Some folks think that COBOL, the language of the past, may also be the language of the future!

"Micro Focus COBOL for Presentation Manager has suddenly become the right language." . . . . . **BYTEweek, 6/19/89**

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Micro Focus COBOL/2 Workbench Awarded 1989 Professional Solutions Award . . . . . **PC Tech Journal, 2/89**

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"Could COBOL be the key to the success of OS/2?" . . **BYTEweek , 6/19/89**

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REVIEWS/NEW PRODUCTS

Mac portable's pluses outweigh the negatives

The Apple Computer, Inc. Macintosh Portable computer weighs nearly 16 pounds and costs at least $6,500, but its features give it an allure that many current Mac users will find hard to resist.

The Portable sports a 16-MHz CMOS Motorola, Inc. 68000 CPU, which is a low-power version of the 8-MHz 68000 chip found in the Mac Plus and the SE. The Portable runs about twice as fast as a Mac SE and at about half the speed of the Mac SE/30. Memory consists of 1M byte of low-power static random-access memory, currently expandable to 2M bytes. It will be expandable up to 9M bytes when higher-density chips become available. In addition, there are 32K bytes of video RAM. The logic board also contains 256K bytes of read-only memory (ROM) and 128M bytes of settable parameter memory.

Macintosh Portable

Price: $6,499

- Performance: Very good to excellent
- Documentation: Excellent
- Setup: Excellent
- Ease of use: Excellent
- Serviceability: Excellent
- Support: Unacceptable to poor
- Value: Satisfactory

The Portable has a 10-in. diagonal LCD. Although not backlit, the active matrix LCD design is easy to see in most light conditions and from any angle.

The built-in floppy drive has the same 1.44M-byte capacity as those found in all other Macs from the SE on up. It reads all popular disk formats, and there is a port for an external floppy. A second internal floppy drive or a 40M-byte internal hard drive can be added. The hard drive is a 3-in. unit with a 28-msec access time.

Other external ports are comparable to those on other Macs and, more importantly, use the same connectors. There are two RS-232/RS-422 serial ports that have Appletalk capability, one small computer systems interface, the external floppy drive port and one Apple Desktop Bus (ADB) port. It also has a stereo sound port and external digital video port.

The Portable has four internal slots for expansion: the RAM slot, the Processor Direct Slot, the internal modem slot and the ROM slot. The four internal slots are all new designs, which means that cards designed for other Macs will not work.

The Portable gets its juice from a replaceable lead acid battery that has six to 12 hours of life between charges.

The system goes into sleep mode when not in use. Sleep can be induced by the user or set to take place after a period of inactivity. Sleep also occurs when the battery needs to be recharged. The system wakes up when a key is pressed or when a wake-up alarm goes off. It can also be set to wake up when the internal modem detects an incoming call.

The unit has an additional CPU rest mode. After 15 seconds of inactivity, the system slows from 16 to 1 MHz to extend the battery's life. It will snap out of this rest state as soon as any activity occurs.

The Portable's footprint is approximately 15 in. square. With the display up, it is 11 in. high at its tallest point.

The 63 keys on the Portable's keyboard are the same size and arrangement as those found on other Mac keyboards. Mac users should feel right at home if they can do without a numeric keypad and adapt to the trackball. If not, the trackball can be swapped for a numeric keypad.

It was obviously important to Apple that the Portable be a true Macintosh. The only software compatibility problems involve applications that directly address the serial ports or ADB.

Apple's *Macintosh Portable's LCD is easy to see*

The Portable comes with the usual Mac series of manuals and system tools, including the following: the "Macintosh Utilities User's Guide," "System Software User's Guide 6.0.4," "Hypercard User's Guide" and "Installing Apple Network Products." Documentation designed specifically for the Portable includes "Set Up Your Macintosh Portable, an Owner's Guide," "Hypertalk Beginner's Guide: An Introduction to Scripting" and the "Macintosh Portable Handbook."

The standard-size keyboard and the trackball allow users to get right to work. The fact that Apple uses common connectors for the external ports will make the Portable fit easily into any Mac environment.

Apple offers first-rate workmanship. The logic board has four layers with components on the top and bottom. Everything appears to be surface-mounted, and there is no evidence of last-minute patches. Apple's support policies, however, are primitive. There is a 90-day warranty and dealer-only support.

With a hard disk and a modem the Portable costs a daunting $6,948. In the DOS market, of course, less-powerful but still-useful portables in a wide range of sizes and weights are available for less than $1,000.

Apple Computer, 20525 Mariani Ave., Cupertino, Calif. 95014. 408-996-1010.

Planperfect: A few advantages

Wordperfect Corp.'s Planperfect is a full-featured spreadsheet featuring simple spreadsheet linking capability, database features and presentation graphics. Version 5 includes two new command interfaces: a Lotus Development Corp. 1-2-3-like menu system accessed with the slash key and a pull-down menu system tied to the Escape key. For Wordperfect users, the function-key commands remain intact.

With the exception of its database functions, Planperfect supports all of Lotus Development Corp.'s 1-2-3 Release 2.01's @ functions, plus several additional functions. It also duplicates 1-2-3's regression, matrix and data table tools and offers user-defined functions.

Planperfect's For Each function is particularly useful. It returns a list of values from a range that meet a specified condition. It is used in conjunction with other functions such as Sum, Ave and Count.

Another new feature is designed to handle multilevel budgets that contain subtotals. Entering a plus sign will sum the preceding vertical range of numbers, creating a subtotal. A cell with two plus signs will add the first level of subtotals, three plus signs will sum the second level, and so on.

Wordperfect's *Planperfect features presentation graphics*

Planperfect allows users to import or export 1-2-3 files directly, with an option to convert 1-2-3 macros. Planperfect lacks support for the 1-2-3 Release 3.0 .WK3 format but does support Ashton-Tate Corp.'s Dbase II and III, Planperfect 3.0, Wordperfect files, DIF files and ASCII files. A stand-alone conversion program that can translate files in groups is included.

Planperfect has minimal recalculation that works quite well. File loading is fast, but recalculation times are on the slow side. Planperfect's database capabilities are on par with those found in 1-2-3 Release 2.0, although it uses a different style for querying databases. Sorting can be done by rows or columns using up to 10 sort keys, and there is also a search feature. Data-entry

Continued on page 51

Two tools offer variety of routes to recovery

Ashton-Tate Corp.'s Dbase File Recovery and Comtech Publishing Ltd.'s Dsalvage Professional are recovery programs designed to diagnose and repair damaged Dbase-format data files.

There is a vast difference in the feel and operation of the two programs. Dbase File Recovery is almost completely automated. The user should be knowledgeable enough to assess file damage, since the program offers little advice.

Dsalvage Professional is more flexible. Not only can data be recovered in an automated manner, but the program's large collection of tools can be used to recover and fine-tune file data.

File recovery

Dbase File Recovery tries to retrieve any data that the hardware can read. It never alters original files; all changes are written to a separate output file.

The program works with any system accommodating Dbase III, Dbase III Plus or Dbase IV. It also recovers Dbase IV SQL tables and, according to Ashton-Tate, supports Fox Software, Inc.'s Foxbase, Nantucket Corp.'s Clipper, Alpha Software Corp.'s Alpha 3 and DBXL. Files with embedded end-of-file markers and null data, shifted data and damaged headers can be recovered. Data can be retrieved from deleted or Zapped files, even from disks with a corrupt directory or file allocation table (FAT). Disk partitions greater than 32M bytes are supported. It requires 256K bytes of memory to run. A utility determines the index expression used to create a damaged index and writes a Dbase program to rebuild the index.

Two special input file specifications, Disk and Free, allow access to data not normally reach-

Continued on page 49

Dbase File Recovery Version 1.0

Price: $99.95

- Performance: Good
- Documentation: Poor
- Ease of learning: Satisfactory
- Ease of use: Good
- Error handling: Very good
- Support: Good to very good
- Value: Satisfactory

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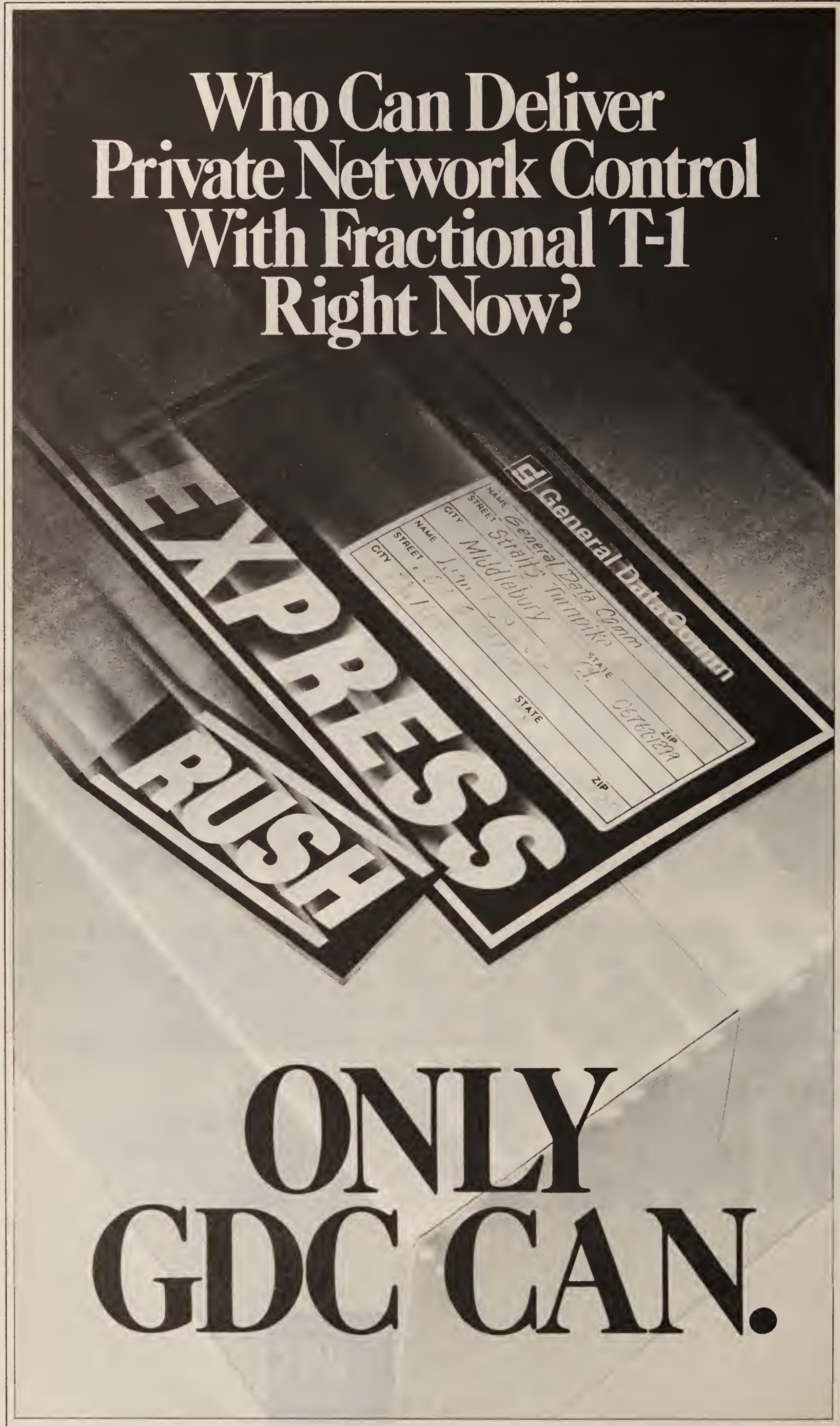

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General DataComm

Recovery

FROM PAGE 45

able by DOS. If a disk's directory is destroyed, the Disk specification opens the entire drive as a read-only file and lets users view and save data from anywhere on the disk. If the directory is intact but the lost data is in a deleted file or in lost clusters on the disk, the Free option opens all unallocated space on the disk as an input file.

Dbase File Recovery tries to recover data with as little user intervention as possible. The Saving Records process can be configured to operate in one of three modes. Its standard mode of operation, Write mode, requires that the user identify the damaged file and an output file and press Enter to begin recovery.

Each record is displayed on the screen as it is processed. If there is no problem, the record is written to the output file. If the program does not think the data matches the correct pattern, the user is informed with an error message. The user must choose to skip the record or write it to the output file. There is no opportunity to edit the data. Any changes to the data must be made with Dbase after the salvage process is complete.

In Manual mode, the program pauses for user intervention as each record is processed. In Automatic mode, the entire file is processed without operator intervention. Questionable records are simply skipped and omitted from the output file.

Dbase File Recovery makes no effort to diagnose and inform the user of the type and extent of damage. It requires user intervention only when an error occurs. As a result, the user is given little information and may end up confused about what to do next.

Dsalvage Professional Version 2.1

Price: $199.95

- Performance: Good
- Documentation: Excellent
- Ease of learning: Very Good
- Ease of use: Good
- Error handling: Good
- Support: Satisfactory - Very Good
- Value: Very Good

The manual is full of problems and therefore does not offer much help. Likewise, much information is omitted from the on-line help. Reading the manual and walking through the damaged file examples provided takes a couple of hours and gives the user a vague idea of the program's operation. Unfortunately, the user will not really begin to understand what is going on until actually attempting to recover several files with differing types of damage. Once learned, however, the program is quite easy to use.

Ashton-Tate offers unlimited support on a non-toll-free line; bulletin board service support through Ashton-Tate, Compuserve and GENIE; and a 30-day money-back guarantee. Technicians are persistent and helpful.

Dbase File Recovery costs $99.95. It successfully restores damaged files, but it suffers from poor documentation and provides little guidance on the type of damage or the steps required to repair it.

Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, Calif. 90502-1319. 213-329-8000.

Dsalvage Professional

Dsalvage Professional is an automated utility that diagnoses as well as salvages damaged data files. It comes bundled with Paul Heiser's book, *Salvaging Damaged Dbase Files.*

The program runs on IBM Personal Computers, XTs, ATs and compatible machines running DOS 2.0 or higher. A minimum of 384K bytes of memory is recommended, of which at least 180K bytes must be free. Drive partitions of up to 32M bytes are supported. The next revision promises to support larger drive partitions. All Dbase, Foxbase Plus, Clipper, DBXL and standard DBF files are supported.

Dsalvage Professional is actually several tools in one. It provides procedures to recover from typical internal and external Dbase file damage. It also includes a file header editor and three types of data editors: a record editor, a byte stream editor and a hex editor. Disk Minder, a low-level editor from Westlake Data Corp., is included and allows the user to examine and edit all portions of a disk, including the directory..

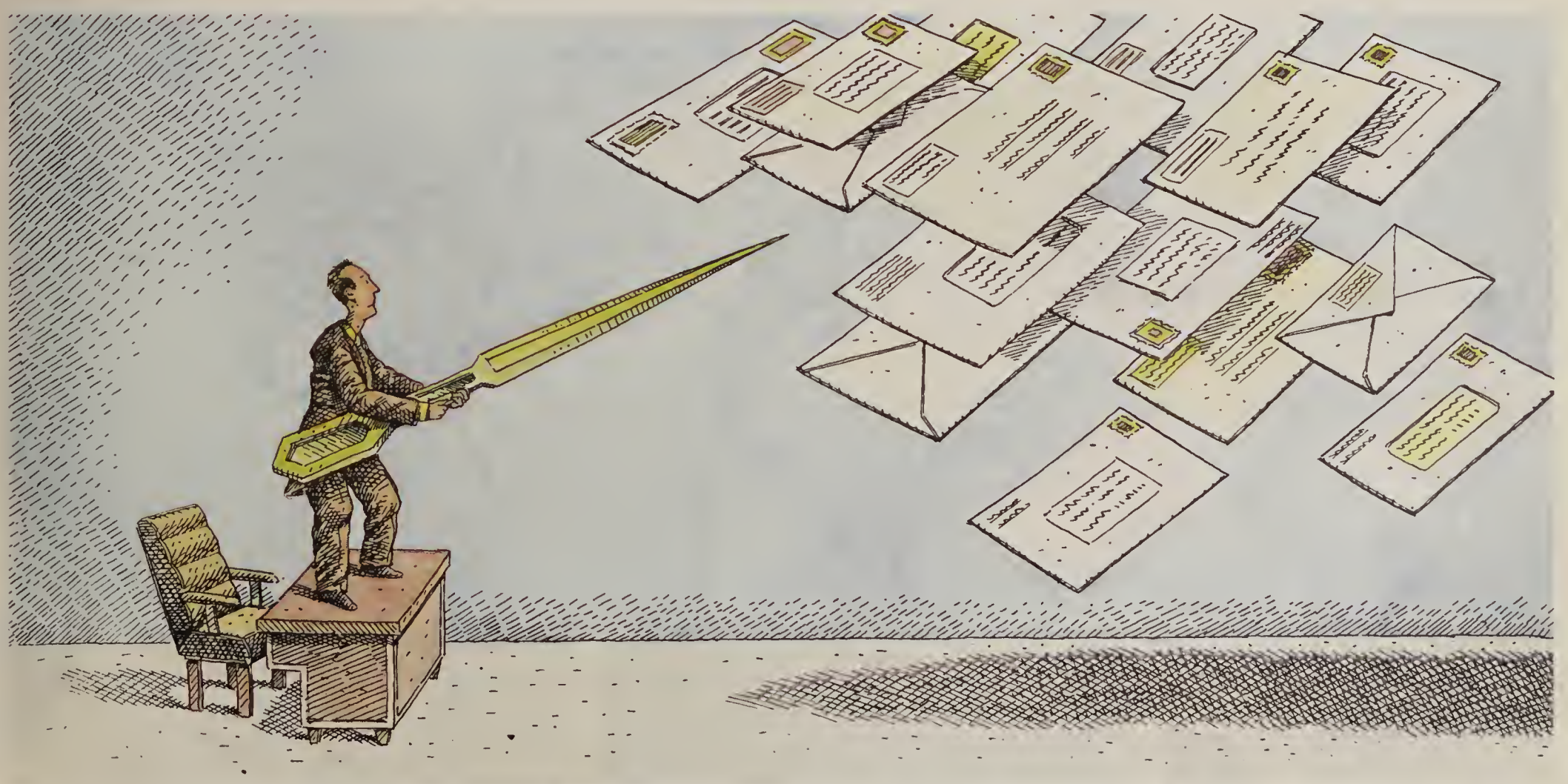
> DBASE FILE Recovery tries to recover data with as little user intervention as possible.

The program operates in a simple step-by-step repair process. The user specifies the damaged file name and location, then tells Dsalvage to diagnose the file. Dsalvage examines the file and reports back a description of the problems and suggests a recovery process. The user can choose either to run the suggested recovery process, run a different process or use one of the editors to repair the file manually. After the repairs are complete, the user runs the diagnosis again to check for residual damage.

Dsalvage has extensive online help, and it comes with several sample damaged files. Dsalvage Professional has done an admirable job of combining ease-of-use functionality for the novice with powerful low-level control for the expert. Comtech Publishing offers unlimited telephone and facsimile support on non-toll-free numbers. The technical support staff is courteous and knowledgeable.

Dsalvage Professional provides peace of mind and a powerful weapon when disaster strikes. It lists for $199.95, including the program, the Heiser book and Disk Minder. There is a version for $99.95, which takes out some of the manual features, the Disk Minder editor and the Heiser book.

Comtech Publishing Ltd., P.O. Box 456, Pittsford, N.Y. 14534. 716-586-3365.



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Planperfect

FROM PAGE 45

forms can be developed to facilitate data input. There is no support for directly accessing external database files.

The product now supports mixed graph types and graphs with dual y axes — but not three-dimensional graphs. However, two graphs can be displayed simultaneously, and the graphs are highly customizable with respect to colors, hatchings and fonts.

Graph settings separate

Graph settings are stored in separate files, independent of the worksheet for which they were defined. The setting files include cell ranges but not the actual values. The only graphics file format supported is the Wordperfect graphics file format (.WPG).

Planperfect borrows much of its output capability from Wordperfect. The user has full control over the output, including multiple fonts and type sizes. Edit mode is not what-you-see-is-what-you-get, but different screen colors can be assigned for various attributes. There is a graphics page preview for viewing one or two pages at a time exactly as they will be printed.

Planperfect's macros can reside within a spreadsheet or be stored individually in files for access from any worksheet. The macro language is the functional equivalent to 1-2-3. A point-and-shoot menu of macro commands is available.

Planperfect lets users link files together by pulling in selected cells or ranges from files on disk. These links cannot be used in formulas.

Planperfect is the only spreadsheet currently available that can use a hard disk for virtual memory if the user runs out of random-access memory. It also supports expanded memory.

Planperfect Version 5.0

Price: $495

- Performance: Satisfactory to very good
- Documentation: Satisfactory
- Ease of learning: Satisfactory
- Ease of use: Good
- Error handling: Very good
- Support: Very good
- Value: Good

Planperfect is distributed on a dozen 5-in. disks and includes an installation program. The documentation comprises a three-ring binder, a quick reference guide and a paperback workbook. The workbook covers some specific applications of the product in an easy-to-follow, hands-on manner. On-line help is available.

The product has a timed automatic backup option, as well as an option to create a backup automatically when a file is saved. There is an Undo command that can be disabled. Completely lacking are auditing features. Before exiting, Planperfect asks if the user wants to save. It displays an additional message only if the file was not modified. It lets users erase an unsaved worksheet with no warning.

Unlimited support

Wordperfect provides unlimited toll-free support weekdays between 7 a.m. and 6 p.m. The support technicians are knowledgeable.

Planperfect lists for $495. Although the program's user interface has improved, it is still too jumbled and inconsistent. The program's main audience is still Wordperfect users. For others, Planperfect offers few real advantages over other more popular spreadsheets in the same price range.

Wordperfect Corp., 1555 N. Technology Way, Orem, Utah 84057. 801-222-4000.

MICRO NOTES

Meridian reverses direction, opts for open architecture

Reversing its proprietary direction, **Meridian Data, Inc.** has unveiled an open architecture for its compact disc/read-only memory publishing systems.

The offer of software and documentation will enable users to format and integrate third-party disk drives to supplement Meridian's CD Publisher. The vendor will also offer its disk drive diagnostic system.

Lotus Development Corp.'s Freelance Plus 3.01 has received a "Best Buy" award from *Computerworld* sister publication *PC World* in the latter's November evaluation of personal computer graphics software packages. It also garnered No. 1 ratings in recent competitive reviews conducted by *Infoworld*, another sister publication, the *Software Digest Ratings Report* and other trade books.

Nynex Computer Services and **Prodigy Services Co.** last week announced that Nynex will offer Prodigy's interactive information service in the Northeastern states. Nynex will construct and own Prodigy computer sites in New York and New England.

Parlez-vous francais? Watch for the release of a French version of **Ingres Corp.'s** Ingres relational database management system and related documentation in the first quarter of 1990.

Apple Computer, Inc. said its Macintosh computer will be used as a workstation for **Siemens Medical Systems, Inc.'s** Picture Archiving and Communication System (PACS). Coupled with proprietary hardware and software from Siemens, the Litebox workstation will deliver digitized images from a host of medical imaging systems.

Sun Microsystems, Inc. recently won its largest bank automation contract to date with the sale of approximately $17.6 million worth of Scalable Processor Architecture-based systems to Banca Popolare di Bergamo. Sun will install workstations and servers in branches near Milan.

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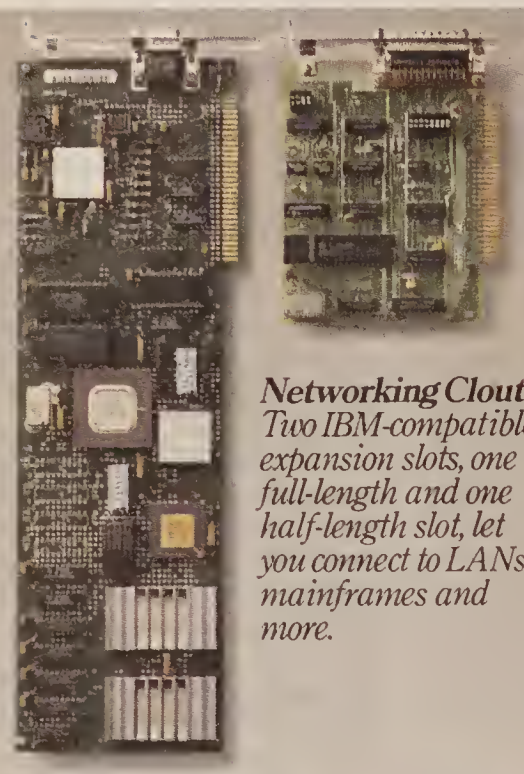

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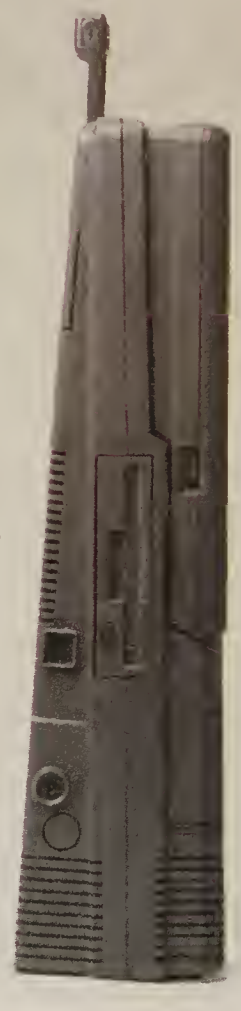

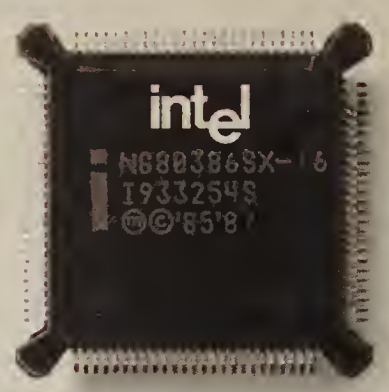

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In Touch with Tomorrow

TOSHIBA

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Sun hoping Sparc grows in embedded field

Company hoping to turn over fertile soil among toasters and autopilots

ANALYSIS

BY JAMES DALY
CW STAFF

In the near future, those golden-brown nooks and crannies that make your morning English muffin such a delight may come to your breakfast table courtesy of a reduced instruction set computing (RISC) chip. At least that is what they are hoping for at Sun Microsystems, Inc.

While competition to supply speedy RISC chips to the systems market has become tight and vicious, Sun's marketing team is increasingly pushing microprocessors that employ Sun's Scalable Processor Architecture (Sparc) toward ground it believes is still fertile and untilled — the embedded controller field.

Unlike the kind of user-programmable chips found in personal computers, embedded chips are intelligent circuits that are preprogrammed to serve as the brains of devices ranging from the autopilot on an airplane to an automated teller machine or a home toaster.

"The applications certainly are not as glamorous [as those on the desktop], but they will help us get into the market much faster," said Byron Ryono, a technology licensing manager at Sun. Ryono added that half of all Sparc chips are now headed for the embedded market and predicted that the percentage will increase.

Two forces are driving Sun's move. First off, there is plenty of money to be made. "Embedded chips have a much lower profile, but they far and away account for a majority of chip sales," said Michael Slater, editor of the industry newsletter "Microprocessor Report."

Dog eat dog

Second, the competition to provide RISC chips for desktop systems has become a dogfight, and Sun is getting chewed up. Digital Equipment Corp., Silicon Graphics, Inc. and a dozen other companies have all committed to using the RISC design offered by one of Sun's staunchest competitors — Mips Computer Systems, Inc.

Moreover, the ranks of potential desktop systems designers are rapidly thinning. IBM is developing its own proprietary RISC design for a workstation that is due to be released early next year, while Apple Computer, Inc. is reportedly building a new model around Motorola, Inc.'s 88000 chip.

Sun's Sparc strategy also suffered a minor setback in September when Phoenix Technologies Ltd. abandoned its Sparc development efforts, citing financial difficulties.

There are also persistent rumors that AT&T may renege on its plans to build a midrange Sparc-based system. Development efforts are said to be on hold while AT&T evaluates Intel Corp.'s and Motorola, Inc.'s RISC offerings.

Although Sun claims to have secured more than 1,400 Sparc software applications and is shipping a lot of hardware, only Sun, Solbourne Computer, Inc. and Korea's Tatung Co. have actually delivered Sparc machines for the desktop.

The most important of the still-undelivered Sparc commitments is with Toshiba Corp. Sun is pitching the Toshiba deal as a sign that Sparc-based machines will enter the PC and workstation markets in a big way; however, it has been a long and frustrating wait for users.

> ADDITIONALLY, IT IS still not clear whether Sun's ambitious strategy of aggressively licensing the Sparc design is going to be a success or a crashing failure.

Additionally, it is still not clear whether Sun's ambitious strategy of aggressively licensing the Sparc design is going to be a success or a crashing failure. If enough vendors grab a license and begin pumping out Sparc machines, it could project Sparc into the lead as the industry's de facto standard. If it fails, Sun could be left with an oddball technology.

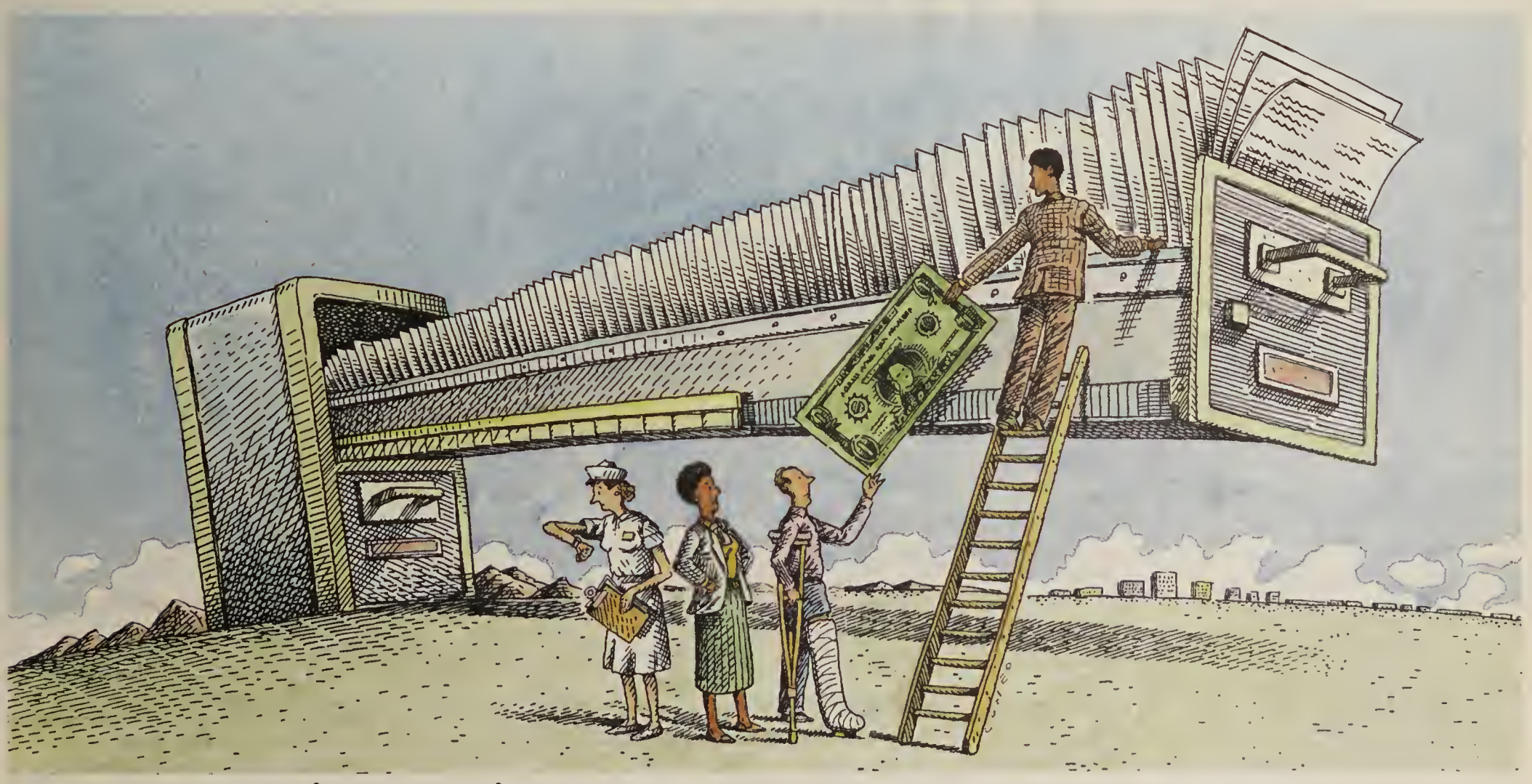
In August, Sun began hedging its bets when it granted a Sparc license to Dutch conglomerate N.V. Philips, which promptly stated that it would build the design into embedded controllers.

Playing it up

Sun has since played up similar Sparc announcements where an embedded chip is key. For instance, Austin, Texas-based Systems and Processes Engineering Corp. said that it will use the design in satellites and other aerospace projects; in another example, CERN, the Switzerland-based laboratory, announced the use of Sparc chips in machines involving particle research.

All of the Sparc licensees are actively pushing the chip into the embedded market, according to Armando Viteri, group marketing manager for Sparc. Most are discovering that it is really an easy sell. "In most cases, the embedded community places the very same demands on an architecture that the commercial world does: a very high I/O rate and the need to manipulate data and store it very fast," Viteri said.

So, if Sparc does not wind up winning all its battles on the desktop, it may still win the war. And English muffins may never taste the same again.



"This system just can't process claims fast enough. And that makes for a lot of dissatisfied customers."

Beating back a Basic bad rap

BY CHARLES VON SIMSON
CW STAFF

REDWOOD CITY, Calif. — Basic is no tech-weenie language, no way. But for Thomas Button, Microsoft Corp.'s program manager for Basic, convincing people of that can be an emotional struggle.

"It is amazing how many people use it but won't admit it," Button said. "The perception of Basic as a language is horrible; it is seen as powerless. The view is that people who program in Basic are not very good programmers."

Button points with pride to the fact that Microsoft owns at least 70% of the microcomputer Basic market now that rival language superpower Borland International has returned its Turbo Basic development rights to the original developer, Robert Zalem, an independent software writer.

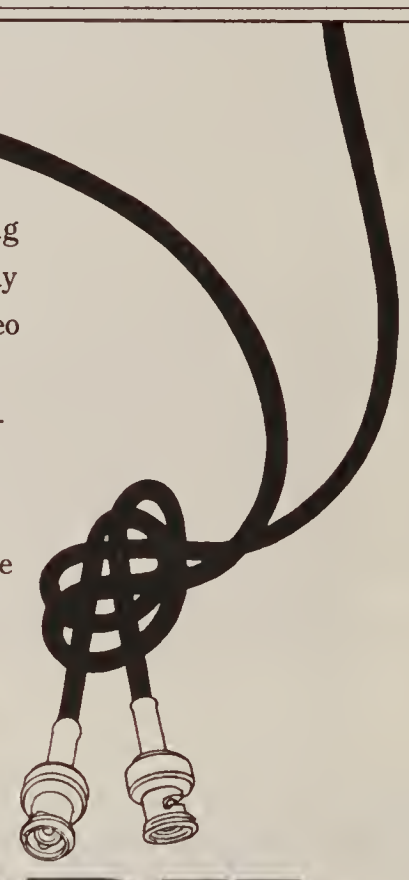
Market researchers do not break the numbers down by each language, but Microsoft leads Borland by a 40% to 20% share of the total personal computer language market, according to International Data Corp. estimates. The firm expects to ship nearly 100,000 units of Quick Basic next year. At $99 per package, that represents nearly $10 million added to Microsoft's bottom line.

In addition, in a Microsoft analysis of the first four months of 1988, Quick Basic accounted for 46% of total Microsoft language sales to the Fortune 100 firms. The company said it believes that percentage has stayed relatively static. In contrast, Microsoft's two flavors of C accounted for just 30%. This is attributed in part to Microsoft's head-to-head competition with Borland in the C market.

Microsoft's strength in the market among large accounts stems largely from the fact that Basic was the language of choice when the first round of corporate PC systems were installed, users said.

Aetna Life and Casualty standardized on Microsoft Basic in its casualty division for just that reason. "Basic can be a bear to use," said Robert Zack, technical advisor in the division, "but our original systems were written in 1984 in a Basic that the vendor no longer supports, and so [we] went with Microsoft to minimize the impact of the change on the business."

Adding to its C offerings, Microsoft said it will ship a Basic compiler targeted at business users and priced at $495 this week, well beyond the price range of the 35% of Basic users who are hobbyists or home users. "Sixty-two percent of the total market is corporate developers, either in-house at major corporations or developing vertical industry applications," Button said. "Research shows us that for those developers who live and die by [Basic], price is not an object as long as it [is low enough to stay] off their corporate cost sheet."



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Christmas

CONTINUED FROM PAGE 43

takes into account similar studies performed by the Goddard Institute for Space Studies, the Geophysical Fluid Dynamics Laboratory and Oregon State University.

Unlike most other global warming studies, the results of the software model will be key to the report the EPA will present to Congress by year's end.

Hunter said that because the software is in the public domain, it had to be converted to run on the most sparsely configured PCs possible. "This includes making it run within the boundaries of 640K in the DOS operating system and 640K in system memory," he said.

This was no easy project, since programmers at NOAA had to take nine different software programs to build a consummate model of the Great Lakes water system to begin with. These applications then all had to run on a VAX 11/780. After being ported to a Microvax II, the software had to be rewritten again to run on the most minimal of PCs.

VMS uses paging memory, which acts as if the system has unlimited memory to access at any given time. These files are a far cry from DOS' 640K-byte barrier. Hunter and a NOAA analyst, Holly Hartmann, achieved this by writing the code to files that depended on disk I/O, instead of depleting system memory.

"This, of course, has its own baggage, as the progam would be degraded by disk I/O, which is much slower than accessing memory," Hunter said. "On top of this, we were taking minicomputer programs and porting those to a Microvax 2000. Then we had to try and get a similar performance out of a PC."

To their surprise, the PC not only ran the programs faster, but the conversion was less painful than expected. "Using PC Lahey F77L Fortran to rewrite files written in VAX Fortran was, amazingly, pretty straightforward," Hunter said, as Lahey implements most of the same formats as VAX Fortran structures.

The models were built by taking data ratios from more than 120 tracking stations and drawing historic data sets spanning the last three decades to determine model air temperatures, precipitation, humidity, wind speed and cloud cover.

The model takes into account findings confirmed by the National Academy of Sciences, the World Meteorological Organization, the United Nations Environment Programme and the International Council of Scientific Unions.

Alexander

FROM PAGE 43

The case goes back to September 1987, when data began disappearing from a six-terminal, multiuser system owned by Southeastern Color Lithographers in Athens, Ga. The firm's owner hired a local computer store to trace the cause of the errant data. When the store could not find any problems with the network's hardware or software, it cobbled up a program that indicated that the terminal used by Williams, who was a cost estimator for the printing firm, was also the terminal from which the data had been deleted. The central piece of evidence submitted by the prosecution was a computer-generated printout listing sequences of commands to delete data.

During his trial, Williams averred his innocence and said that he simply did not know enough about Xenix, the operating system on the Altos network, to be able to deliberately delete the data. He also charged that the detection software program that pinpointed his terminal could have easily been altered by someone to frame him.

Williams' use of computer ignorance as a defense required the prosecution to prove that in fact he was computer-literate, a legal first, experts say.

Who knows if Williams is innocent as he claimed or a disgruntled employee out to "mess up the company," as the prosecution asserted during the trial? The conviction is being appealed, and presumably the truth will prevail.

In the meantime, the case raises a number of interesting points that should make end users wary. In fact, end users should throw up their hands and refuse to touch their keyboards until the legal issues arising from the case are resolved.

The first issue is the one of determining precisely under what circumstances an employee can be held responsible for bollixing up a computer system.

If an unhappy employee sets out to wreck a company's business by deleting critical computer files, then there obviously must be legal recourse for the employer. After all, putting a time bomb in a computer system is hardly different than jamming a monkey wrench into a piece of manufacturing gear.

But what if the end user destroys valuable data by accident? Anyone who has used a personal computer knows how easy it is to inadvertently lose files.

If the employer can assert, by means of a computer-generated printout, that an end user issued a sequence of commands intended to delete data, what can an end user do in the face of such "evidence?"

Further, the end user would be hard-pressed to prove that it was an accident, especially if data was lost, say, two or three times in a year. After using PCs for nearly 10 years, I still lose stuff regularly.

Most troubling is that virtually any file-deletion-detection program could be tampered with to make it appear that an end user set out to destroy data. If an end user is framed, he or she is on an automatic trip to the big house, it seems.

Suppose a PC network crashed and data was lost while several employees were simultaneously using the system and making demands too heavy on its processing ability. Would that make every user on the system liable for the value of the data that was launched into the electronic ether? Logic suggests it would not, but logic is often in short supply when the boss or information systems manager is up to his or her neck in alligators because data was lost.

Also consider that an end user could do substantial amounts of damage using a coworker's terminal that was logged on but unattended. That sort of thing goes on around here often enough: The fellow who sits in a cubicle near mine has caused mischief using my terminal while I was off doing something else. From now on, I won't be so trusting, and neither should any other computer user. Otherwise, you may find yourself counting roaches on the wall in a cell.

Alexander is *Computerworld's* senior editor, advanced technology.

Micrografx touts products for developers and users

BY SALLY CUSACK
CW STAFF

RICHARDSON, Texas — Playing to both software developers and end users, Micrografx, Inc. recently unveiled two packages — one for Microsoft Corp.'s Windows environment and the other for object-oriented graphics applications.

Mirrors 1.0 is a set of software development tools designed to simplify porting Windows applications to OS/2's Presentation Manager platform.

The program utilizes a proprietary set of OS/2 Presentation Manager dynamic-link libraries to duplicate the function calls used by Windows applications to interface with the Windows systems services.

All Windows applications use a universal set of function calls, the company said, although each application uses only a subset of the total possible function calls. The product will be licensed based on the number of applications to be ported.

Micrografx also released an addition to its Special Edition Clipart family of electronic vector-based line art for use on Intel Corp. 80286- or 80386-based machines. The Computers & Office Automation Special Edition library offers more than 450 images. One megabyte of memory and a hard drive are required for operation, and resolution density is determined by selected output device. It retails for $149.95.

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NEW PRODUCTS

Software applications packages

Laptop Connections has introduced a multiuser distributed database software package designed specifically for laptop computers.

Called Connect, the product is suited for sales, technical, and time and billing applications. A proprietary Refresh feature is also included. Refresh connects to a hub system and facilitates the immediate data transfer of all pertinent updates and changes to field personnel and other employees requiring the information.

The product is priced from $100 to $500 per user, depending on the number of users.

Laptop Connections
Suite 106
100 Granger Blvd.
Marlboro, Mass. 01752
508-480-8377

Smart, Inc. has announced the release of a software product intended to assist in managing appointments and schedules of one or more people.

According to the company, Professional Diary and Appointment System Version 1.0 runs in either standard- or memory-resident mode and includes point-and-shoot menus, a note editor and context-sensitive help screens.

The program is available for $195.

Smart
Suite 11
856 S. Aspen
Broken Arrow, Okla. 74012
918-369-2566

Accounting By Design has introduced an integrated bookkeeping package designed for small businesses.

Bookkeeping By Design, the company said, runs under Microsoft Corp.'s Windows, allowing it to multitask other Windows applications while running bookkeeping tasks in the background.

The bookkeeping program also supports sideways printing and exact column alignment of proportionally spaced fonts.

Bookkeeping By Design has a retail price of $695.

Accounting By Design
Suite 501
2140 Shattuck Ave.
Berkeley, Calif. 94704
800-548-9179

K-Talk Communications has announced the latest version of its Mathedit software.

According to the company, Mathedit 1.2 is an equation editor that allows users to create math expressions to be inserted into word-processed documents.

Equations can reportedly be stored in formats accessible by Microsoft Word, Wordperfect Corp.'s Wordperfect and Micropro International Corp.'s Wordstar.

The suggested list price of Mathedit is $149.

K-Talk
Suite 100
50 McMillen Ave.
Columbus, Ohio 43201
614-294-3535

Peripherals

Microspeed, Inc. has announced a precision trackball for Commodore Business Machines, Inc. Commodore Amiga computers.

The Amtrac pointing device includes a cursor drag lock feature that eliminates the need to hold down the button when dragging the cursor, according to the company.

The three-button unit is 4¼ inches wide and is priced at $99.

Microspeed
44000 Old Warm Springs Blvd.
Fremont, Calif. 94538
415-490-1403

Mitsubishi Electric Sales America, Inc. has announced a computer data/video projector for screen sizes from 70 to 120 inches.

According to the company, the Model VS-1250 projector provides automatic variable frequency scanning from 15 to 36 KHz horizontal with 1,100 horizontal lines of resolution.

The VS-1250 will accept a variety of video input signals, including red-green-blue analog and TTL.

The stated list price of the projector is $14,300.

Mitsubishi
5757 Plaza Drive
P.O. Box 6007
Cypress, Calif. 90630
714-220-2500

A flatbed optical scanner aimed at desktop publishing and graphics users has been announced by Kyocera Unison, Inc.

The A-800 desktop can scan a standard 8.5-in. by 11-in. page in 14 seconds, the firm said.

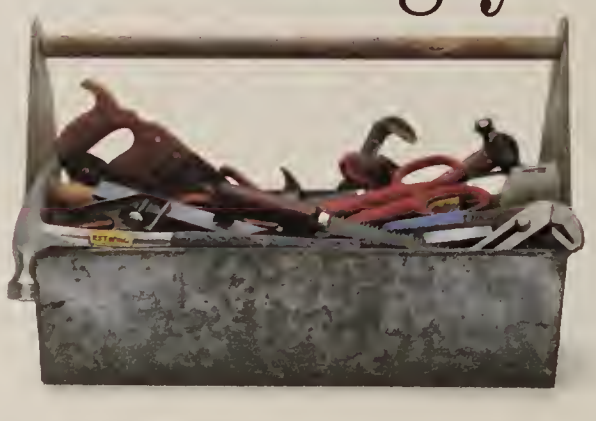
It provides image previewing and image scaling functions, and it offers an optional document feeder.

The scanner costs $1,985 and includes an interface card, cable and imaging software.

Kyocera Unison
1321 Harbor Bay Pkwy.
Alameda, Calif. 94501
800-367-7437

Knowledge Man/2.

The other guys.



No other application development package puts so many tools at your fingertips.

KnowledgeMan/2 combines a relational data base, SQL Server support, and a fourth-generation programming language with a set of development tools that the other guys can't match. All of these tools are seamlessly integrated, too, so you'll never need to exit one before using another.

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What's more, KnowledgeMan/2 was designed to make real application development possible on as little as 640K, and provide an upward migration path to OS/2, LAN and VAX environments. It wasn't ported down from larger systems like others.

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- Natural language interface capabilities
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DATA STREAM

Ellis Booker

Next wave: videophones

As a lad who grew up watching George Jetson and family talk on videophones, I fully expected that some day I would see my friends on a TV screen when I called them. Well, it hasn't worked out that way — not yet, that is.

Available bandwidth is the stumbling block for video over the public switched telephone network. True, it is *possible* to send pictures through an analog voice line, provided you're content with a "freeze-frame" image (sort of a video facsimile) somewhat larger than a postage stamp that requires you and the person on the other end to wait as the voice portion of the call is interrupted and the picture makes its sluggish way through the network.

Such freeze-frame video units may be good for transmitting mug shots between a county jail and a police station, but I suspect they hold little appeal for consumers weaned on the hyperactive pace of music videos and soft-drink commercials.

Closer to the mark are the full-motion videoconferencing setups used by barons of industry or, increasingly, computer executives speaking at trade shows. ("Don't bother attending, Boss. Just reach out and touch 'em. If they start grilling you about our fourth-quarter results again, we'll break the circuit!")

The trouble with this application is that it requires deep pockets. Consider that a single videoconferencing room costs about $100,000, not to mention the expense of the dedicated private lines (typically T1 facilities) linking the locations in a point-to-point fashion. Temporary very small aperture termi-

Continued on page 60

Inside

- Tariffs on tap in new, improved NRP. Page 58.
- DEC hitches its CIT wagon to Mitel's PBXs. Page 59.
- Icot's virtual memory feature is miserly with RAM. Page 59.

Racal eyes broader mantle

BY ELISABETH HORWITT
CW STAFF

Racal Electronics PLC recently took a giant step toward its goal of becoming an full-source networking provider by acquiring Digital Communications Associates, Inc.'s Network Communications Group for $28 million. At the same time, Racal has made yet another addition to its already-large stable of network management systems.

As a company whose strategic focus is wide-area networking, Racal should provide some much-needed direction to the DCA subsidiary, according to Tim Zerbiec, principal and vice-president at Dedham, Mass., research firm Vertical Systems Group. Formerly independent T1 vendor Cohesive Network, the division's activity has been "meager to nonexistent" under DCA, he added.

DCA chose to retain its T3 subsidiary, Digital Transmission System, which leaves a gap in Racal's switch line, since the System 9000 would have limited support at best of the 45M bit/sec. interface, Zerbiec said. DCA's long-range plans for its T3 group will be reassessed as part of an overall review of the company's direction, which is just starting now, a DCA spokesman said.

On the other hand, Racal will be acquiring several useful items along with DCA's T1 switch line. One is a high-speed bridge between multiple local-area networks, which DCA reportedly has described to analysts but has not formally announced yet.

A critical part of Racal's acquisition will be Open Network Management System (ONMS), which is designed to be a multivendor network management system based on the Open Systems Interconnect (OSI) Common Management Information Protocol.

Racal, which has been reselling DCA's System 9000 T1 multiplexers under its own label since 1987, is already in the process of integrating ONMS with its own Communications Management System, according to Glen Smith, vice-president of marketing at Racal's telecommunications equipment subsidiary, Racal-Milgo.

The high-end System 9000 will be used for very different applications from Racal's own low-end T1 switch line, so users will probably be content to keep separate as long as the vendor provides integrated network management, Zerbiec said.

Racal will "absolutely honor" the commitments DCA has made both to keep ONMS compatible with the OSI standard and to integrate it with other major network management platforms, Smith said. DCA has already connected the system up to IBM's Netview via the Netview/PC interface and has demonstrated a link to AT&T's Accumaster Integrator, he added.

DCA was one of the first seven vendors to commit to supporting Digital Equipment Corp.'s Enterprise Management Architecture (EMA) but has held off announcing a shipment date while negotiations with Racal were in progress, Smith added.

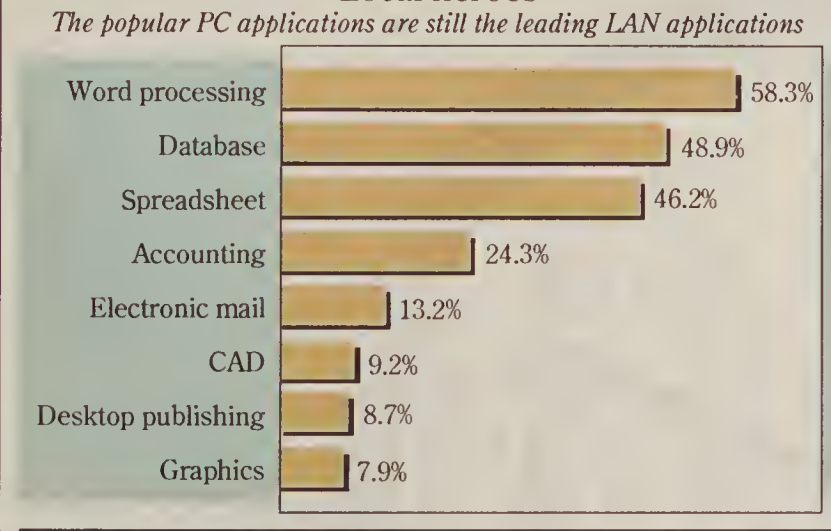
With the acquisition of ONMS, Racal has "a lot of network managements, for [managing] dial access, leased-line modems and now ONMS for T1," Smith said. The company plans "step-by-step integration, as much as makes sense, but no one big management system," he

Continued on page 58

Data View

Local heroes

The popular PC applications are still the leading LAN applications



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CW CHART: DOREEN DAHLE

Tariff 12 lures customers with one-stop shopping

BY JOANIE M. WEXLER
CW STAFF

Several recent AT&T Tariff 12 contracts indicate that, ironically, some companies are finding they have much to gain by returning to the one-stop-shopping approach to telecommunications that was forced upon them prior to Jan. 1, 1984. Chemical Banking Corp. and Paine Webber, Inc. became the most recent companies to take advantage of the custom voice/data networks provided by AT&T under Tariff 12.

Chemical Banking Corp., a Tariff 12 customer that signed a three-year, multimillion-dollar contract at the end of last month for more than 85% of its long-distance voice and data business, said that with the new network, it will reduce its AT&T billing accounts from 120 to five while eliminating the accounts from MCI Communications Corp., U.S. Sprint Communications Co. and Cable & Wireless, which are currently providing network services to Chemical Bank along with AT&T.

AT&T expects Federal Com-

Continued on page 60

Host-PBX applications in spotlight

BY ELISABETH HORWITT
CW STAFF

Vendors have recently intensified their efforts to stimulate users and developers' interest in applications that mesh computer processing power with private branch exchanges' (PBX) networking capabilities.

When asked to describe useful applications for host-PBX integration, vendors generally cite two examples. The first uses an automatic number identification feature offered by some PBXs to bring up information about the caller on the user's screen, even as the user answers the phone. This allows telemarketers and other customer service people to provide prompt, personalized attention to answering users.

The second application, which is generally used in outbound telemarketing, has the computer initiate a series of calls on the PBX from a database of prospects, with the user only connected when a call has actually gotten through to the target.

However, two major obstacles have prevented such applications from becoming truly feasible. First of all, users will not be able to take full advantage of caller number identification services until there is full deployment of Integrated Services Digital Network (ISDN) services throughout the U.S. by both interexchange and local carriers.

Secondly, despite carriers' talk of "open" computer-PBX application interfaces, a standardized way for the two systems to exchange messages is still at the definitional stage, according to Bill Young, director of marketing for customer premises equipment at Northern Telecom, Inc.

In the absence of such standards, vendors have been frantically forming alliances to give users as broad a range of applications and host-PBX combinations as possible. Recent introductions have included the following:

- Digital Equipment Corp. announced a new ally and the first application it had developed internally for its Computer Integrated Telephony program (see story page 59).
- AT&T announced the publication of specifications for an "open applications interface" that is said to allow various types of hosts to exchange information with AT&T's Definity family of PBXs. The Adjunct/Switch Application Interface (ASAI) is said to be based on Integrated Services Digital Network and Open Systems Interconnect. AT&T has also entered agreements with DEC and Stratus Computer, Inc. to develop message sets allowing those vendors' hosts to communicate with AT&T PBXs.
- IBM last week announced enhancements to its voice/data products, including a new 12-channel version of its Voice Response Unit, said to provide up to 35% cost-savings per port and process more telephone calls simultaneously while also supporting IBM's Netview system.

Tariffs join the network planning equation

BY ELISABETH HORWITT
CW STAFF

Digital Communications Associates, Inc.'s Network Resource Planner, originally developed by Quintessential Systems, is said to allow managers to determine what will happen to network response time or cost levels if bandwidth is changed on a particular link or a new connection added. Available now, the system also includes a database of the latest carrier tariffs, updated on a monthly basis, so that users can do comparative cost analysis for various network changes.

Analysis of this type "used to require an exotic math tool," but the graphics-based, mouse-driven product makes such capabilities available to more users, said Marty Grubin, senior product manager at DCA. For example, users can get an overview of all network nodes and links or ask the system to go through various iterations until it finds the right combination of cost and response time.

The package automatically collects network parameters from DCA's System 9000 T1 switches and from IBM's Network Control Program. Users can also feed in parameters from other types of network equipment manually, Grubin said.

Modeling capabilities for local-area networks and packet switches are planned, and modeling for switched network services will be available next year, he added.

DCA recently announced the first shipments of the product, as well as two enhancements. The first is the addition of fractional T1 services to the Pricer Tariff Database, with services from AT&T and Cable & Wireless initially included. The enhanced Pricer is available now for $20,000.

The second NRP enhancement is a Mesh Designer module said to enable network managers to create models of distributed processing networks. The product is scheduled to ship first quarter of next year, base-priced at $58,500.

NRP runs on a Sun Microsystems Inc. 3/60 workstation and is base-priced at $16,500.

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Racal

FROM PAGE 57

added. Some customers will want to just buy systems that can cost-effectively manage "a small, dial-based network," Smith said.

Racal also will acquire DCA's Network Resource Planning, a modeling tool that is said to allow users to create what-if scenarios for capacity planning for wide-area networks (see story above).

The Racal-DCA deal also represents a move on DCA's part to divest itself of its telecommunications equipment business, choosing to concentrate its efforts in the personal computer communications and micro-to-mainframe markets, according to DCA Director of Marketing Joseph Rosenthal.

> THE acquisition will be Racal's fourth within the last year.

DCA's product lines in those areas include the Irma and Forte lines of terminal emulation boards and LAN gateways to IBM hosts, as well as the Crosstalk PC communications software and 10Net LAN lines.

Approximately 468 DCA employees will be merged into Racal's Florida-based wide-area networking subsidiary, Racal-Milgo. Expected to be finalized within the next 45 days, the acquisition will be Racal's fourth within the last year.

Icot emulator addition: Miserly with memory

BY JOANIE M. WEXLER
CW STAFF

SAN JOSE, Calif. — A virtual memory feature recently added to Icot Corp.'s Standard Omnipath IBM 3270 emulator is said to deliver five windowed host sessions, printer support, application programming interfaces, file transfer and mainframe graphics in return for using a paltry 40K bytes of random-access memory.

RAMiser, announced late last month, was designed to keep users from having to make tradeoffs between functionality and memory, according to Kenn Dahl, Icot's vice-president of marketing.

To that end, the product reportedly moves background sessions out of DOS' 640K bytes of internal memory and onto a memory expansion board, hard disk, network file server or floppy disk to allow users to hot-key between personal computer applications and mainframe sessions without having to disable the emulation software.

For example, if users are running a DOS application, the emulation software is moved out of internal memory and into expanded memory — if available — or onto a storage device. If a mainframe session is being run, the DOS application is moved out.

Automatic, systematic

Users can reportedly specify a hierarchy for where they want the background sessions sent so that when they press the "hot" keys, the background session automatically moves to the preferred storage medium.

"The way the various terminal emulation products on the market differentiate themselves is by adding ease of use or by providing extra features for the same or less memory," said Glenn Schiller, a senior industry analyst at Dataquest, Inc., a research firm based in Cupertino, Calif. "It's tough to put a dollar value on the added convenience RAMiser provides, but it does carry a high antifrustration value."

The upgraded Standard Omnipath package competes, in a way, with the vendor's own Ksaver and Ksaver XL memory management options.

Ksaver requires 75K bytes to support two terminal sessions and one printer session. Ksaver XL, like RAMiser, uses 40K bytes to provide the 3270 emulation but supports just one session instead of five. According to the vendor, however, the Ksaver options offer a speed advantage over RAMiser.

Icot charts its closest competitor as Attachmate Corp., based in Bellevue, Wash. Attachmate's Extra! single-session 3270 emulator requires 44K bytes of memory for a single-user 3270 coaxial connection to a mainframe and 77K bytes for a single-session local-area network-to-mainframe connection, according to Attachmate.

RAMiser comes bundled with all Standard Omnipath emulators shipped after Dec. 1; existing Omnipath customers will receive free upgrades, according to the firm.

Users of Intel Corp. 8088-, 80286- or 80386-based IBM Personal Computers or Personal System/2s that have expanded memory or extra storage capacity can transparently use the feature, according to Icot.

Mitel joins DEC's CIT supporter parade

BY ELISABETH HORWITT
CW STAFF

BOSTON — Digital Equipment Corp. added some cargo to its Computer-Integrated Telephony (CIT) bandwagon recently with an agreement to interface its hosts with Mitel Corp.'s private branch exchange (PBX) systems.

DEC also announced a PBX call management application for the VAX.

Mitel is the fourth PBX vendor to announce support for DEC's CIT platform, which supports applications that integrate the capabilities of an intelligent PBX switch with a VAX host.

The other vendors that support the CIT platform are British Telecom, Siemens AG and Northern Telecom, Inc. Siemens and DEC are providing applications to integrate VAXs to Siemens' Hicom 300, not to the recently acquired Rolm PBX line.

Personal services

DEC announced its first CIT application, called the VAX CIT Message Desk, which is said to provide call management and online personal phone book services for PBXs.

In addition, the vendor announced CIT Version 2, which includes enhancements such as access to the Decvoice Response System.

While the announcements demonstrate DEC's aggressive pushing of its computer-PBX platform against rivals such as IBM and AT&T, users may not yet see the business application of any of these systems, according to Thomas Nolle, president of Haddonfield, N.J., research company CIMI Corp.

"My view is that the computer-PBX hookup is like a virus the industry picks up every couple of years: They say it's time to integrate voice and data applications," Nolle said.

Even though some useful applications have emerged, "I think users are still not ready to invest" in such products, Nolle added.

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SYBASE

Booker

CONTINUED FROM PAGE 57

nal connections are another expensive alternative.

Recently, makers of coder/decoders (used to send compressed video signals over a network) have begun offering units that work on 56K bit/sec. or 64K bit/sec. digital lines.

More interesting, carriers are offering *switched* 56K bit/sec. services, which will be followed by 64K bit/sec. ones. Not being shackled with a point-to-point videoconferencing network adds a major plus to the videophone concept. Instead of dedicated rooms with fixed cameras, a $30,000 to $50,000 coder/decoder that weighs 100 pounds can be wheeled around or between corporate centers.

"Within three years, the premium for switched 56K bit/sec. or 64K bit/sec. service should be only around 20% more than dial-up lines," says Al Lill, director of local-area telecommunications at Gartner Group, Inc., who adds that the image quality of coder/decoders is doubling every 12 to 18 months.

What's more, next July the CCITT's coder/decoder standard, PX64, will be published. In theory, at least, that will allow intercompany calls, whereby Company A calls Company B's coder/decoder, even if the two use different gear. For now, the vast majority of videoconferencing is intracompany.

But what about the residential homebody who wants a videophone?

The Integrated Services Digital Network (ISDN) holds the key. The Basic Rate Interface (BRI) specifies two 64K bit/sec. B channels and one 16K bit/sec. D channel for packet signaling. Already, some coder/decoder manufacturers are supporting ISDN applications that combine the two B channels into a 128K bit/sec. pipeline.

Two obstacles remain. First and foremost is the lack of ubiquitous ISDN BRI access. Even ISDN champions admit this will take years to address. In addition, the home subscriber presumably will want a single ISDN line, not a block of them, which is how ISDN is currently sold by all the nation's local phone companies.

Coder/decoder prices will need to tumble. Taking the long view, I think video, especially high-definition TVs and videophones, are favored to be the next great consumer electronics wave.

A potential market is there, and the network technology is almost there. George Jetson fans need wait just a little longer.

Booker is *Computerworld's* Chicago correspondent.

Tariff 12

CONTINUED FROM PAGE 57

munications Commission (FCC) approval on the Chemical Bank contract during the first week of January. The new network, which will support a combination of T1, 56K bit/sec., 64K bit/sec. and inbound and outbound voice services among 250 U.S. locations, is slated to be fully operational by the end of first-quarter 1990.

Another new Tariff 12 customer, Paine Webber, a national brokerage firm, has contracted for a T1 backbone network that will link 280 locations nationwide.

The custom-designed network, according to Robert Benmosche, an executive vice-president at Paine Webber, will provide more timely information to clients and brokers in addition to allowing the company to manage its internal telecommunications costs better.

AT&T designed a network for Paine Webber that will allow branches accessing the company's main computer in Weehawken, N.J., to cut response times in half, according to Benmosche. Currently, buy-sell stock orders travel through the Quotron Systems, Inc. financial network en route to Paine Webber's data center; the T1 backbone will reportedly eliminate that step.

Paine Webber has completed its first major rollout in the north central region of the country and expects to wrap up the network implementation by May 1990.

Both Paine Webber and Chemical Bank will retain responsibility for network management, according to the two companies.

Benmosche pointed out that the contract for Paine Webber's network was signed early last summer, but that MCI and Sprint delayed its implementation by challenging AT&T's legal right to offer custom voice/data networks.

He estimated that the delay cost his company "hundreds of thousands of dollars."

The challenges to Tariff 12 were refuted on Oct. 26 when the FCC ruled that AT&T could continue to offer custom networks — to the relief of such existing Tariff 12 customers as American Airlines, American Express Corp., Ford Motor Co. and General Electric Co.

The price-war legacy of divestiture led many telecommunications bargain-hunters to choose their network services a la carte from different interexchange carriers' menus. That scenario has evolved, for certain companies, into a best-of-both-worlds environment of bulk service offerings, which give users the prices and enhanced services they want along with the benefit of forming a partnership with a single vendor.

Last April, the FCC ordered AT&T to revise Tariff 12 to make the integrated services generally available to all potential customers seeking them.

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NEW DEALS

US West lands ISDN contracts

The **U.S. Department of Energy's Rocky Flat** plant has signed a contract with US West to provide eight Integrated Services Digital Network (ISDN) Primary Rate Interface lines to carry the plant's voice and data traffic. Installation will begin by the end of the year.

US West also has signed an agreement with the **city of Colorado Springs** to provide up to 200 ISDN lines, which will link 141 city offices serving 3,400 employees. The city plans to migrate its 1,800 telephone lines from US West's Centron Centrex service to ISDN.

Southwestern Bell Telephone has signed contracts with five ISDN users, increasing the local carrier's total ISDN customers to 15. The new customers are **IBM**, **Mitchell Energy**, **University of Texas**, **Datapoint Corp.** and **Shell Oil Co.**

Teleport Communications in Boston announced three new clients for its fiber-based metropolitan-area network: **Colonial Management**, **Tri-Star Communications, Inc.** and **U.S. Sprint Communications Co.**, which will use the teleport to link its Boston customers.

Infonet has signed a five-year, multimillion-dollar agreement to provide computing and communications services to **JP Foodservice, Inc.**, a food distribution company. Under the outsourcing agreement, Infonet will provide computing power, systems software maintenance and network management; JP Foodservice's information systems department will handle application software development and end-user support.

Network Management, Inc. has landed a $4.9 million contract to design, install and test token-ring local-area networks for the **U.S. Social Security Administration.** Under the contract, which was awarded through the General Services Administration, the Fairfax, Va., network management consulting company will install a total of 60 LANs throughout the U.S.

American Business Network Partnership, a cooperative buying partnership of more than 60 large U.S. companies, has signed a $25 million contract for MCI Communications Corp. to provide voice and data networking services. The agreement was signed on the partnership's behalf by M&SD Network Services Division, a subsidiary of EDS Communications Corp.

Citicorp signed an agreement for MCI to provide voice and data networking services at a value that is expected to exceed $80 million over a three-year term. Meanwhile, Citicorp's parent company, Citibank N.A., has signed a three-year, multimillion-dollar agreement to have AT&T provide integrated voice and data network services for Citibank's credit-card business.

Hertz Corp. has signed up AT&T to integrate its disparate multivendor data networks into one nationwide data network. The consolidated network will support speeds ranging from 9.6K to 1.5M bit/sec. and will be interconnected via AT&T's Datakit II Virtual Circuit Switch. It will carry asynchronous, IBM Systems Network Architecture, X.25 packet-switched and Unisys Corp. Uniscope traffic.

The Port Authority of New York and New Jersey has awarded a $15 million contract to **Teleport Communications Group, Inc.** to build and operate a new telecom network linking Port Authority terminal and transportation facilities throughout the bistate region. The teleport firm already worked with the Port Authority to develop a teleport on Staten Island.

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NEW PRODUCTS

Local-area networking hardware

Multi-Tech Systems, Inc. has announced its RS232LAN hardware and software product. The unit comes in both four- and eight-port models and was designed to connect smaller work groups together.

Remote communications capabilities can be provided by as many as eight modems, the vendor said. The product includes a multiport serial card and all necessary software for establishing a fully functional local-area network.

A four-port configuration sells for $899, and an eight-port configuration costs $1,199.

Multi-Tech Systems
2205 Woodale Drive
Mounds View, Minn. 55112
612-785-3500

Intellicom, Inc. has introduced a 10M bit/sec. Ethernet local-area network product that supports both standard and coaxial cable.

The Quick-Net 3000 series incorporates adapter cards and twisted-pair wiring. It is reported to be compatible with Novell, Inc.'s Netware, 3Com Corp.'s 3+Share and IBM's Personal Computer Network Program. According to the vendor, the product allows PCs to be located and distributed via twisted-pair wiring while retaining access to the coax-based Ethernet backbone.

The product is targeted at small business offices, high-rise buildings and campus-style layouts. A four-user starter kit is available for $3,500.

Intellicom
9259 Eton Ave.
Chatsworth, Calif. 91311
818-882-8866

Advance Micro Research, Inc. has introduced an eight-user version of its Unterminal Video Network Adapter (VNA) board.

The VNA Plus runs in conjunction with Intel Corp. 80386-based personal computers in AT&T's Unix or multiuser DOS environment. It allows PC-compatible monitors and keyboards to be connected to a single 80386 machine as fast, graphics-capable user stations, the organization said.

The product is priced from $1,595.

Advance Micro Research
Paragon Point
3 Lagoon Drive
Redwood City, Calif. 94065
415-595-9991

Local-area networking software

Grapevine LAN Products, Inc. has introduced the GV LAN OS, a peer-to-peer local-area network created to support multiple topologies. The product allows users to create a network of up to 255 personal computers, including laptops.

The Netbios-compatible LAN offers such features as disk-based print spooling, network file and program sharing and electronic mail functions. Pricing starts at $140 per station on the network.

Grapevine LAN Products
15323 N.E. 90th St.
Redmond, Wash. 98052
206-869-2707

Comtrol Corp. has announced a networking software designed to allow personal computer users to communicate with other PCs, local-area networks, minicomputers and mainframes via the X.25 protocol.

Developed for use with the company's Smart Hostess and XP Plus intelligent communications controllers, PC.25 UX sofware supports multiple physical links, with each link capable of multiple virtual circuits. It can also be used as a building module for LAN bridges and gateways, protocol converters, multiplexers and data line monitors.

An eight-port Smart Hostess with 256K bytes of random-access memory and PC.25 communications software costs $2,490. The XP Plus eight-port configuration with the software retails for $3,040.

Comtrol
P.O. Box 64750
St. Paul, Minn. 55164
800-333-1022

Network management

Network Systems Corp. has announced a series of network management products and services designed to support IBM's Netview and Transmission Control Protocol/Internet Protocol interfaces.

The NMS-4 is reported to be a comprehensive hardware and software system for network management based on the eight-plane color Vaxstation 3200 from Digital Equipment Corp. The system's H960 software program includes an event filter that allows users to customize monitoring functions as well as menu-defined user reports. An H968 software package is also available for the DEC Microvax II platform. Both versions include the DEC Ultrix operating system and a suite of network management applications from Network Systems.

The software packages are priced at $28,000 each. The complete NMS-4 package with the DEC Vaxstation 3200 system costs $80,000.

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2. Do you need to manage more types of cabling than the phone company?

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4. Is your application development backlog over 6 months? Over 1 year? Over your head?

5. Are you feeling insecure about your PC LAN security?

6. Is the performance of your network going down as the number of users goes up?

7. Do your computing vendors spend more time pointing fingers at each other than pinpointing problems?

8. Is it impossible to expand your computer system the same way you add users. . .incrementally?

9. Is Engineering having trouble communicating with Marketing? Is Building 2 difficult to reach from Building 6? Is the second floor not talking to the seventh?

10. Are your users wasting time trying to communicate with uncommunicative hosts?

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IS YOUR NETWORK IN NEED OF WASTE MANAGEMENT?

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Network services

AT&T has extended its reliability warranty program to include its highest capacity digital business service.

The company said its latest Service Assurance Warranty will apply to the Accunet T45 Service. The service transmits digitally encoded information, such as voice, data and video, at rates of 45M bit/sec.

The warranty will provide credits to customers if they experience a service interruption, and AT&T will credit up to 100% of one month's price for each Accunet T45 Service circuit that experiences outages.

Credits will be calculated independently for each outage, and credits begin at 5% for an outage of 59 minutes or less.

AT&T
National Product Center
1 Speedwell Ave.
Morristown, N.J. 07960
800-247-1212

Customer-premises equipment

A fractional T1 interface channel service unit (CSU), designed to eliminate the need for a T1 multiplexer, has been unveiled by Case/Datatel, Inc.

The DCP3555 T1 CSU Plus is a tabletop unit that reportedly provides two user interfaces so that a private branch exchange can share the T1 bandwidth with a local-area network bridge, computer-aided design and manufacturing terminal or any other synchronous device. The product also can monitor the performance of the T1 link, and errors are reported in separate user and carrier registers. A separate printer port for reporting configuration, events and statistics is also provided. Pricing is $3,175 in unit quantities.

Case/Datatel
Cherry Hill Industrial Center
55 Carnegie Plaza
Cherry Hill, N.J. 08003
800-424-4451

Gateways, bridges, routers

The Software Link, Inc. has announced the PC-MOS Gateway for use with Novell, Inc.'s Netware.

According to the firm, the product is a software shell that allows PC-MOS — its proprietary DOS-compatible, multiuser operating system — to communicate with Netware. Through the shell, a single PC-MOS-based Intel Corp. 80386 node on a Novell local-area network can drive up to 16 inexpensive terminals. The gateway costs $195.

The Sofware Link
3577 Parkway Lane
Norcross, Ga. 30092
404-448-5468

Links

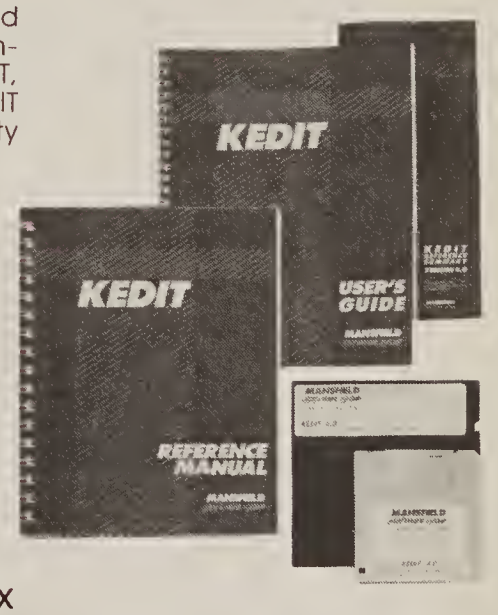
Systems Strategies, Inc. has enhanced its Commlink/LU6.2 connectivity software by incorporating a full implementation of IBM's Common Programming Interface Communications (CPI-C) into the product.

This marks the first availability of the CPI-C program under the AT&T Unix

Continued on page 68

KEDIT 4.0
XEDIT COMPATIBLE PC EDITOR

KEDIT™ is a text editor for DOS and OS/2 that supports most commands and features of XEDIT, IBM's editor for VM/CMS. But KEDIT goes beyond XEDIT compatibility with special PC-based features for a first-rate combination of mainframe power and PC flexibility.



- **More than 100** XEDIT compatible commands and SET options, including the ALL command.
- **XEDIT prefix commands,** targets, and fullscreen layout.
- **Multiple files, multiple windows.**
- **Built-in subset of the REXX** macro language included.
- **Interfaces to Personal REXX,** our complete implementation of REXX.
- **Enhanced block operations.**
- And much, much more.

"While KEDIT remains true to its heritage in retaining compatibility with the mainframe XEDIT, it is also one of the most feature-packed PC text editors around."
PC Magazine, 10/31/88

MANSFIELD *Software Group*
P.O. Box 532, Storrs CT 06268
(203) 429-8402

DOS Version: $150
OS/2 Version: $175
(includes DOS version)
Shipping: $3
Demo version available.

KEDIT is a trademark of the Mansfield Software Group, Inc

Continued from page 67
operating system, according to the vendor.

The software is slated for delivery during the first quarter of 1990. Pricing for the Commlink/LU6.2 software has been set at $4,000.

Systems Strategies
225 W. 34th St.
New York, N.Y. 10001
212-279-8400

Promptus Communications, Inc. has introduced an Integrated Services Digital Network product designed to link work group information systems to digital network services.

Promptus I is said to be an IBM Personal Computer AT Bus-compatible wide-area network adapter that plugs directly into T1 lines to provide faster WAN access. The plug-in module fits into a single 16-bit PC AT slot and utilizes the functions of both a digital and a channel service unit. It costs about $3,000.

Promptus Communications
Portsmouth Business Park
Portsmouth, R.I. 02871
401-683-6100

Connectronix Corp. has announced two internally mounted twin-axial interface cards designed to connect Fujitsu America, Inc. DL 5600 and DX 2300/2400 printers with the IBM line of midrange computer systems.

The CC 7400 card works with the DL 5600, and the CC 7414 was created for the DX devices. Both products give the printers full IBM 4212 emulation capability. The printers and cards are available together for $1,225 and $1,445, respectively.

Connectronix
2260 S. 3600 W.
Salt Lake City, Utah 84119
801-975-7477

Digital Link Corp. has introduced the DL551VX-FT, a fractional T1-compatible, dual-channel data service unit/channel service unit that provides programmable channelization of incoming DTE data.

The product is modularly designed for desktop or rack mounting and can operate as a two-channel multiplexer. End-to-end diagnostics are included, the vendor said. The unit is compatible with several local-area network bridge, router and gateway products and costs $3,495.

Digital Link
133 Caspian Court
Sunnyvale, Calif. 94089
800-441-1142

Skyword Technology Ltd. has enhanced the software for its Skyfax Intelligent PC-Fax Board.

Version 2 of the Skyfax software includes a print-to-facsimile feature, which directly sends the output file of any personal computer application to a remote facsimile station. According to the company, the software also offers dynamic insertion of graphic data into text documents. The product costs $399.

Skyword Technology
1772 Lark Lane
Sunnyvale, Calif. 94087
408-446-9392

Lantronix' IEEE 802.3 Ethernet terminal server provides network connectivity for systems supporting Transmission Control Protocol/Internet Protocol and Local Area Transport over standard Ethernet protocols.

The ETS-8 includes eight RS-423 ports, a microprocessor, memory and a power supply. The basic unit costs $1,695.

Lantronix
Suite 113
26072 Merit Circle
Laguna Hills, Calif. 92653
714-367-0050

Micro-to-host

Sotas International, Inc. has announced a micro-to-host software designed for the Hewlett-Packard Co. HP 3000 series.

Sotas Link gives personal computer users access to the Sotas General Ledger and Financial progams residing on the HP 3000, the vendor said. Data may then be integrated into user spreadsheets, files and graphics for further evaluation and analysis.

A single installation can support an unlimited number of users. The product is priced at $5,000 per host computer.

Sotas International
192 Merrimack St.
Haverhill, Mass. 01830
508-372-0770

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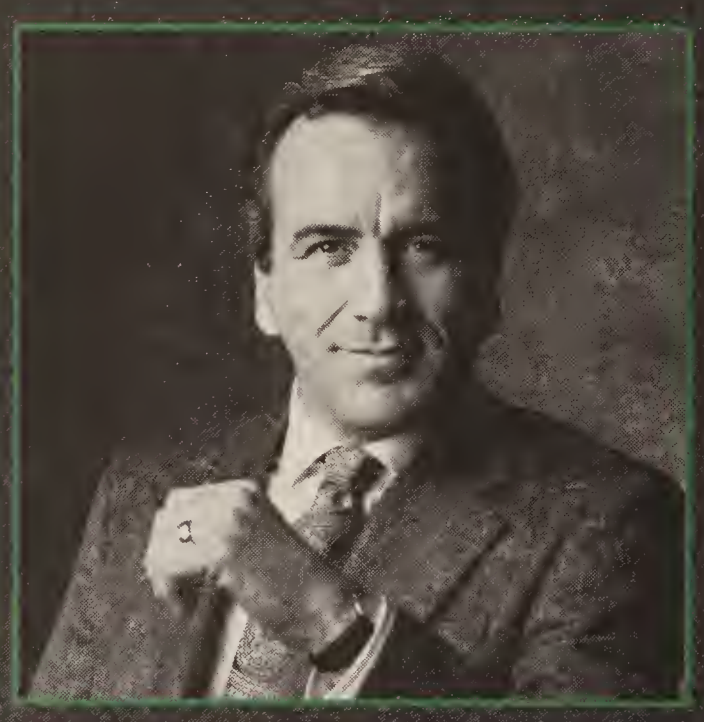

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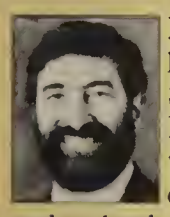

Price Waterhouse has named **Sheldon Laube** its national director of information and technology. Laube, a Price Waterhouse partner, will be responsible for developing and managing the firm's internal information technology initiatives.

As the partner responsible for setting and implementing Price Waterhouse technology policies, Laube will establish procedures regarding the selection, purchase and deployment of technology throughout the firm. He will also be in charge of creating and implementing companywide networking standards and data interchange standards for technological applications.

Laube is a founder of the Consumer Financial Institute (CFI), a division of Price Waterhouse located in Waltham, Mass., and was responsible for that organization's research and development activities.

Prior to CFI, Laube was involved in developing an online information system for community information and referral agencies, designing and implementing a bed-and-breakfast reservation system, developing training seminars to introduce the C programming language and the Unix operating system and consulting with computer manufacturers on marketing strategies for Unix-based products. He was also manager of research support services for the National Institute of Education and systems analyst for Optimum Computer Systems.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Outsourcing: The great debate

A boon to costs and productivity or the siphoning of a company's lifeblood?

TOM MONAHAN

MARK BOLSTER

William Morgan

PRO

Judging from the number of phone calls I receive on the subject, outsourcing is a topic of great interest in the information systems field today. People inquire about the logistics of doing it, the benefits associated with it and the problems that come with it.

At Copperweld Corp., we have done it successfully. The benefits are there — greater than one would imagine — in the areas of personnel cost savings and productivity gains. There can be problems, but nothing insurmountable.

The motivation for the original decision of Copperweld's senior management to outsource the company's data processing function in May 1985 was to cut back on IS expenditures. Looking back on it now, however, Copperweld got far more benefit than anticipated from that decision.

At that time, Copperweld, a Fortune 500 company during the 1970s, had lost or made very little money from 1982 to 1985. The company has had, however, increasing profits in every subsequent year and today is one of the strongest companies in our industry.

I would like to credit the turnaround to the outsourcing decision, but I can't. However, it made a definite contribution.

The objective of the outsourcing was to save money, mainly through a reduced head count. All but two or three of our IS operations positions were to be eliminated. There were also anticipated savings in areas such as office space, power, air-conditioning and other IS-related expenses.

The timetable put together for the project was aggressive. The decision was made in July 1985; the contract was signed with the outsourcing vendor in September, and we were completely switched over and operational by the day after Thanksgiving.

Continued on page 72

Morgan is vice-president of IS at Copperweld Corp.

CON

Why would a company outsource the lifeblood of its business — the information?

This lifeblood is defined as follows: "Who are our customers? What products do we make and sell? Who are our employees? What are our production costs and other major pieces of information?"

SAL DIMARCO/BLACKSTAR

Stefan Gladyszewski

As a result of several discussions with outsourcing vendors, I believe they sell their services to companies by focusing on two very emotional and extensively documented issues.

The first is rather obvious: "We can reduce your costs." The second is more difficult to document, but sounds something like this: "Let's get this operation under control for you."

Each of these points, depending on the company, has some validity. However, if a company is serious about the long-term contribution of automation to its business, it can do a better job of managing this critical resource than an outsider.

The cost issue usually focuses on the age-old concept of economies of scale to drive down expenses. However, many Fortune 500 companies, led by IBM and including General Signal Corp., are implementing various forms of consolidation to reduce costs. At General Signal, we have exceeded the 10% to 20% cost reduction usually discussed by outsourcing vendors.

The second issue has been discussed for the 15 years that I have been in this business. IS is perceived as out of control, not able to deliver to the business what it needs, when it needs it, for the economics that make sense.

I believe this is a valid perception in some cases. This situation usually exists based on a combination of senior management's lack of understanding and support for the automation function, and the management of the auto-

Continued on page 74

Gladyszewski is director of operations systems at General Signal Corp.

How to decide on a

More than likely, you've seen a few spreadsheets in your day. The problem is, on any given day you might find several in use within your very domain. One for Mac.® One for MS-DOS.® Even one for MS® OS/2.

But what happens when members of the same corporation need to share ideas and information? The only thing they end up sharing is frustration.

Well it doesn't have to be that way. Now, with Microsoft® Excel you can employ one spreadsheet solution throughout the entire corporation. Because the Microsoft Excel family shares the same file structure, macro language, and most important, interface.

The glue behind all of this is GUI. As you know, the graphical user interface is quickly becoming the industry standard. And that, in turn, means users find Microsoft Excel easy to learn. And therefore, easy to use. They'll be up and running before you know it, sharing files and even macros. All of which means lower training and support costs for the company—as well as a little

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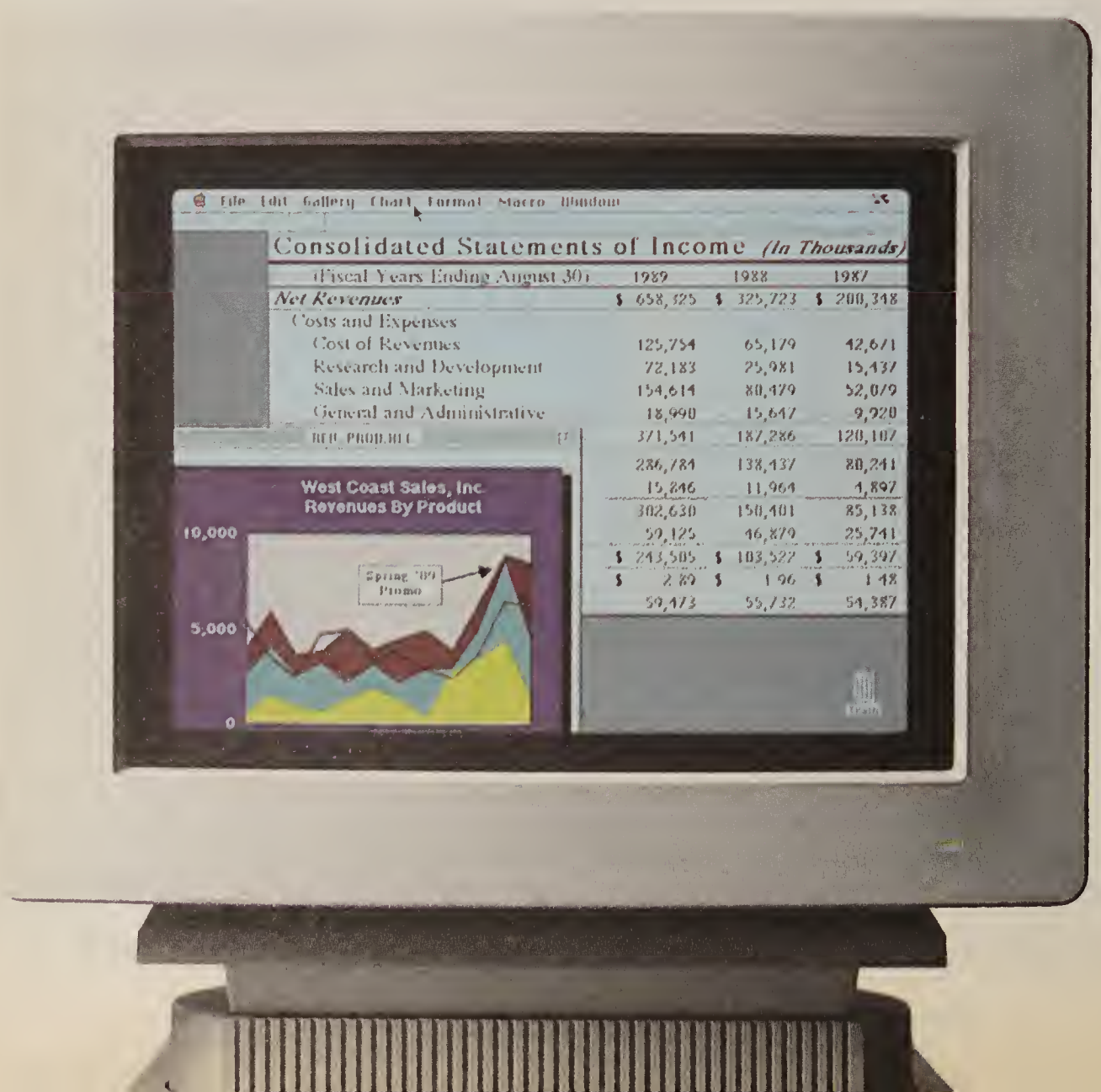

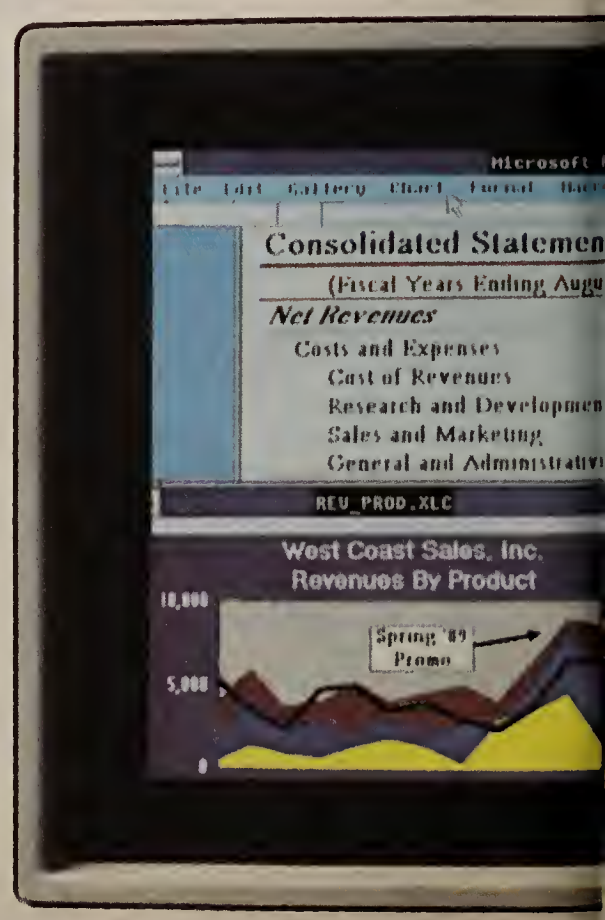

spreadsheet once.

peace and quiet for you.

Beyond the fact that Microsoft Excel is a strategic solution for your company, the plain fact is, users love it. And they're not the only ones. Consider this: Microsoft Excel for Windows won *PC Week*'s Poll of Corporate Satisfaction. And it was voted *InfoWorld*'s MS-DOS Product of the year.

Not to be outdone, Microsoft Excel for Macintosh® received *InfoWorld*'s Mac Product of the Year. And was ranked number one in the *Software Digest* Spreadsheet Review.

Even better, the move to a graphical spreadsheet couldn't be easier. Lotus® 1-2-3® users can simply upgrade to Microsoft Excel for Windows or OS/2, while Mac users can enhance their spreadsheet experience by upgrading to version 2.2.

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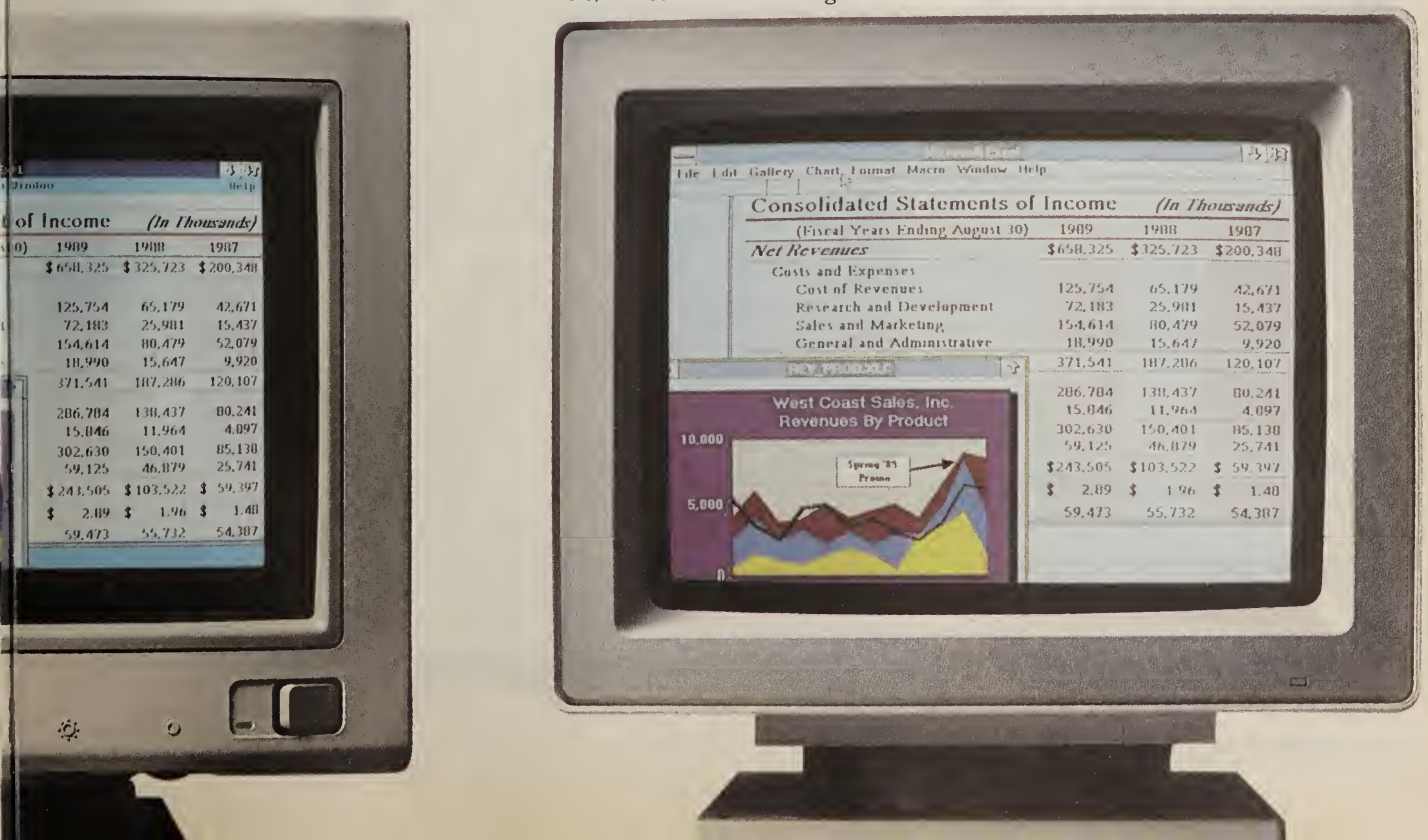


Morgan

FROM PAGE 69

Since some of our plants ran 24 hours, seven days a week, it was essential that our downtime be minimized. We shut down at 6 p.m. Wednesday and were up again by 7 a.m. on Friday. Our plants never noticed the switch.

We had anticipated technical problems, but the move went very smoothly. We also paid a considerable amount of attention to personnel issues. We arranged outplacement consulting, paid a severance to displaced employees and offered a bonus to those who saw the project through to completion, which everyone did.

However, there was a personnel problem that we had not anticipated. There was an underlying feeling among some of the remaining IS people that if this grand experiment failed, we would go back to our own data center. When they realized that this would not be the case, the finger-pointing and name-calling subsided and people started working together to make our venture a success.

We started out meeting weekly with our vendor; it then became monthly; now, the only scheduled meeting is the yearly review of our annual technical plan.

We achieved the benefits we sought at the start. We saved money on people, since we have far fewer. We saved on the management of those people. We no longer needed the data center with its power, air-conditioning and supplies.

Things did not go exactly as we had planned because, in my opinion, we had failed to anticipate all of the benefits.

In the past, a percentage of my time was spent managing the data center. Whatever that percentage was, it is now zero. For the most part, that also goes for my staff and our application development people.

The whole organization is now more effective. The day-to-day problems have been turned over to the outsourcing vendor, and we have one person whose function it is to manage them. We can now focus on profit-generating opportunities, not problems.

Also, some of our early fears about outsourcing never really materialized. We were concerned that the users would be upset. We found that for the most part, the users were indifferent. All they cared about was getting their required service, not where it came from. In fact, the service is now better.

We were also concerned about turning our data — the company's assets — over to strangers. In fact, it is more secure now than before. We were not big enough to put the resources or energy into doing a data center right — the way that a professional management services firm can.

When dealing with outsourcing, there are three things to be cautious of. First, pick a firm that is either very flexible or fits well with your corporate culture. Every company has it own way of doing things, and the outsourcing firm must complement this.

Second, keep the contracts simple. When we first started out, our contract was very complicated, with penalty clauses and restrictions. We had built an atmosphere conducive to problems and finger-pointing. Our present contract is very simple, with no penalties, which lets everyone go about their business without trying to catch somebody doing something wrong.

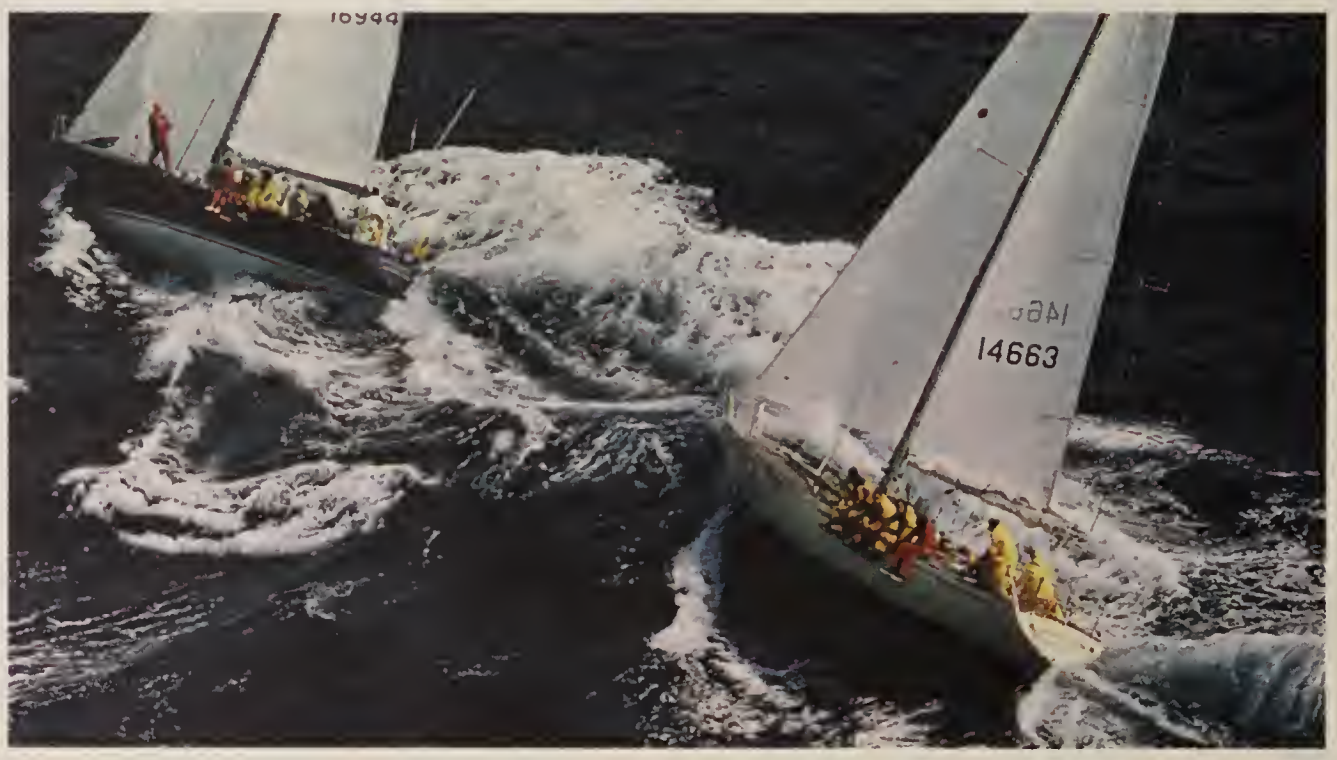
Third, most of your difficulties will be self-inflicted. You have just shocked the organization with a major change. Some of the people will never adapt and will have to leave. Put someone in charge of the difficulties. Focus the rest of the organization on something else.

Why did Copperweld outsource? To put it very simply, to save money, which we did — lots of it. But another important reason why we turned our data processing over to outsiders was the proper allocation of resources. Every action should add to the bottom line. Resources must be free to work on business opportunities, not on problems.

Would Copperweld do it again? Absolutely. In fact, we just signed a new contract. Going back to the old way never enters our mind.

THE ART AND SCIENCE OF SAIL
PLATE THREE

State of the Art



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☐ False

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Gladyszewski

CONTINUED FROM PAGE 69

mation function not being capable of communicating with senior management.

Senior management makes the decision to outsource because they can cut the costs and eliminate all the problems at the same time. This is a rather easy decision.

Why, then, do I believe this to be a decision not in the best long-term interest of a company?

One must first accept my belief that the use of automation is the single most important competitive weapon left in the arsenal of U.S. companies. Enough has been written about this topic, so I will use a more functionally driven approach to make my point.

If we agree that all organizations are trying to improve, we must also assume that to improve, some degree of change is required. Before you install change, an attempt to forecast its results is usually part of the analysis. A thorough understanding of the infrastructure is required to forecast any result.

The information systems that exist in the business are in fact the infrastructure of the business. In order to improve, the infrastructure must change.

There are many examples of this. If your business is product-driven, the infrastructure or system that is used in research and development should be the starting point for change. If product cost is critical to your business, then the purchasing and manufacturing infrastructure is probably where you will start.

A thorough understanding of your current infrastructure is the prerequisite to making improvements and changes. The ability to perform what-if analyses and prototypes is critical to determine what changes you will install in the quest for improvements.

If you do not control the infrastructure, you are giving up something with regard to the entire change and improvement process.

One item that you lose is the knowledge of the current systems and the input of systems professionals in this process. Another item that will change is the cost of the infrastructure. Once the decision has been made to change it, you have to negotiate with outside suppliers over the new costs.

Recently, a great deal has been written to the effect that small incremental improvements in business will not be adequate to ensure their survival in the future, and that the only chance companies have is to make major, radical improvements in very short time frames.

I cannot speak for anyone else, but I would not want to manage these types of projects where I do not control the infrastructure and, most importantly, the people that manage the infrastructure.

If management is concerned about costs, then challenge your IS operation to reduce its expenses. General Signal's IS organization went to management with a plan to reduce costs, and we delivered on it.

If management is concerned about the ability of IS to deliver, they should first understand the issue, support the required groups and stay involved to ensure that dates and financial obligations are met. For the past 2½ years, General Signal's IS has made date and dollars targets that everyone thought were aggressive at best.

Why would a company give up control over a method — information technology — that has the greatest impact on not only what the company does, but how it does it? I certainly wouldn't.

CALENDAR

JAN. 8-14

ATE & Instrumentation West Conference. Anaheim, Calif., Jan. 8-11 — Contact: MG Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

CD-ROM: The New Media of the 1990s. Seattle, Jan. 10 — Contact: Interactive Institute, 557 Roy St., Seattle, Wash. 98109.

PC/Desktop Printing: Expectations & Reality. Monterey, Calif., Jan. 10-12 — Contact: BIS CAP International, One Longwater Circle, Norwell, Mass. 02061.

Pacific Telecommunications Council's 12th Annual Conference. Honolulu, Jan. 14-17 — Contact: PTC '90, Suite 308, 1110 University Ave., Honolulu, Hawaii 96826.

JAN. 15-21

Technical Conference on the X Window System. Boston, Jan. 15-17 — Contact: MIT X Consortium, Room 217, Laboratory for Computer Science, 545 Technology Sq., Cambridge, Mass. 02139.

Computer Graphics Show. New York, Jan. 16-18 — Contact: Computer Graphics Show, No. 409, 817 Silver Spring Ave. Silver Spring, Md. 20910.

Service and Quality Performance Conference. St. Louis, Jan. 17-18 — Contact: Washington University, Campus Box 1220, One Brookings Drive, St. Louis, Mo. 63130.

Superconductor Applications Global '90 Convention. Long Beach, Calif., Jan. 17-19 — Contact: Superconductor Applications Association, 24781 Camino Villa Ave., El Toro, Calif. 92630.

Network Security in the Federal Government Seminar. Washington, Jan. 18-19 — Contact: Infolan Seminars, Attn: Network Security Division, P.O. Box 162323, Austin, Texas 78716.

Software Support Conference. San Francisco, Jan. 18-19 — Contact: Conference Administrator, Institute for International Research, 6th Floor, 331 Madison Ave., New York, N.Y. 10017.

JAN. 22-28

Improving Productivity in EDP System Development. Mesa, Ariz., Jan. 22-26 — Contact: Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

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THE GLOBAL LEADER IN COMPUTER LEASING

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Photo: World Trade Center reaching the 104th floor (taller than the Empire State Building).

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The Empire State Building Rose 5 Times Faster Than The World Trade Center.

☐ True

☐ False

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☐ True

☐ False

Believe it or not, both statements are true. The Empire State Building soared to completion in just a year (1931); the World Trade Center opened in 1973, five years after groundbreaking.

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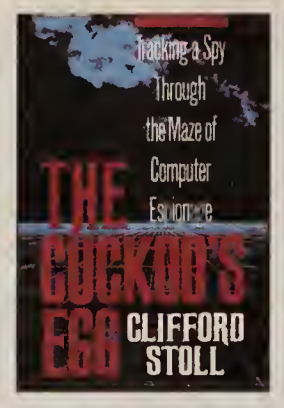
BOOK REVIEW

An espionage tale with a criminal computer twist

THE CUCKOO'S EGG
By Clifford Stoll
Doubleday, $19.95

For more than a year, a hacker broke into hundreds of computer systems, stole sensitive, defense-related information and sold it to the KGB for money and drugs until Clifford Stoll spotted his tracks and nailed him.



The Cuckoo's Egg, Stoll's account of his efforts to track a spy through a web of international computer networks, is a fascinating year-long journey that culminates in the arrest of a band of West German computer hackers turned agents of the KGB.

The story begins in 1986, on Stoll's second day of work as a systems manager at Lawrence Berkeley Laboratory in California. Stoll, an astronomer by training, became a computer security expert by accident after his grant money ran out and he was transferred to the computer center in the building where he worked at the University of California at Berkeley.

As the "new kid on the block," says Stoll, he was given the task of trying to resolve an inexplicable 75-cent accounting error. Stoll's first thought is that the error was probably caused by someone using a "few seconds of computing time without paying for it." However, it turned out to be the hacker's first unauthorized excursion into the system.

This was no ordinary hacker, merely interested in cracking passwords and breaking into computer systems for the challenge. The hacker methodically broke into some 400 computers connected to Internet, the nationwide scientific and defense research network, by ingeniously exploiting little-known bugs in Unix software. Once inside the systems, he left behind "cuckoo's egg programs," which when hatched by the operating system would give him super user status.

"The cuckoo lays her eggs in other birds' nests," Stoll explains. "She is a nesting parasite: Some other bird will raise her young. Our mysterious visitor laid an egg program into our computer, letting the system hatch it and feed it privileges."

It quickly became evident to Stoll that the hacker was after data about nuclear weapons, the Strategic Defense Initiative, intelligence satellites and other information that was potentially damaging to national security if it found its way into the wrong hands.

Instead of simply locking out the intruder, however, Stoll jury-rigged a battery of outmoded and little-used teletypes, printers and portable computers to record the intruder's every keystroke. The hacker was allowed to roam the system at will in hopes that he would stay online long enough for Stoll to arrange for a telephone trace.

To keep the intruder prowling the systems, Stoll contrived dozens of files laced with bogus secret documents that the hacker would spend hours reading and copying.

Once it became clear that the hacker was out to steal information that may be vital to the nation's defense, Stoll attempted to interest the Federal Bureau of Investigation, the Central Intelligence Agency and other federal government agencies in the case.

However, his many initial attempts to enlist their aid were rebuffed, in part because it was not clear to the bureaucrats that the hacker had actually committed a crime and later, when it was determined that the hacker was operating out of Europe, whether they had any jurisdiction in the case.

Eventually the federal government, in cooperation with the Hannover police, closed in and arrested the hacker, who turned out to be a member of a small band of hackers who sold their computer secrets to the KGB for cocaine and thousands of dollars.

The book, often times witty, is written in an engaging, conversational style. Stoll does a good job of feeding the reader the technical tidbits that are important to the story, yet not so many that they become overwhelming.

There are some flaws with *The Cuckoo's Egg*, although none too serious.

The first is that Stoll often interrupts this spy-chase thriller with trite and banal tales of his personal life. He includes a scene in which he proposes marriage to Martha Matthews, his long-time sweetheart, that is sappy beyond belief.

The book's biggest flaw unfortunately involves the tale itself. Stoll manages to capture the reader from the first page and carry him along until the very end, but then fails to deliver on the suspense that he so successfully built up throughout.

In all, *The Cuckoo's Egg* is an exceedingly fascinating account and a first-hand look at computer espionage, which will undoubtedly be one of the most important computer security issues of the coming decade.

MICHAEL ALEXANDER

Alexander is *Computerworld's* senior editor, advanced technology.

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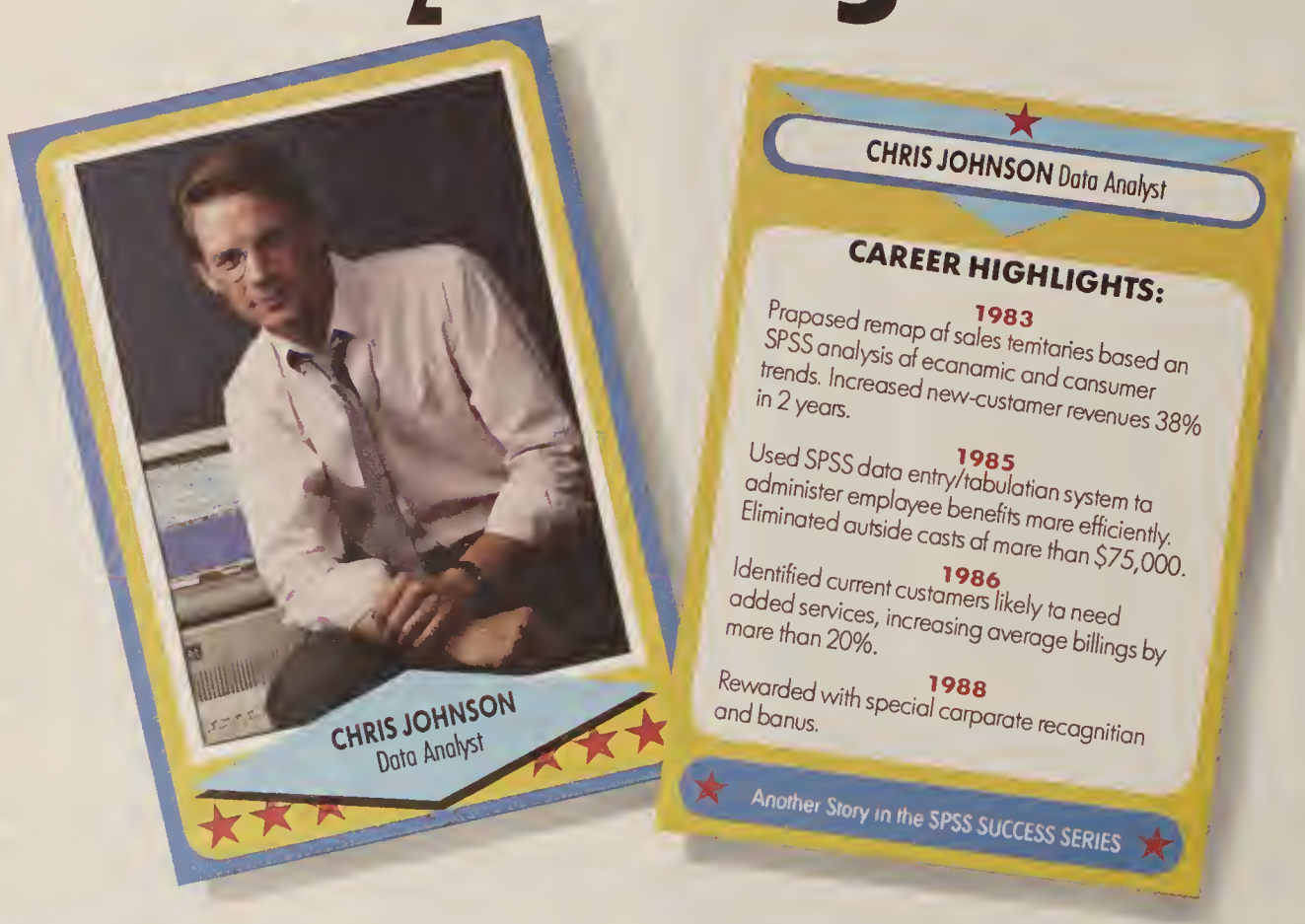

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OS/2 SOFTWARE

It's a matter of time and planning

BY CHRIS YALONIS

When OS/2 celebrated its second birthday this month, very few users were ready to come to the party, mostly because there were still very few applications to play with.

A recent survey of 200 large companies conducted by International Data Corp. revealed that less than 10% were using OS/2 applications or doing any development work with the operating system, and more than half did not know whether they would ever standardize on it. Most of the respondents using OS/2 were running MS-DOS applications on top of OS/2.

While one of the benefits of the environment is its downward compatibility with most DOS applications, a program that runs under OS/2 is far from the same thing as an OS/2 application.

Applications written specifically for OS/2 run in protected mode, which keeps programs from crashing into one another; thus, the number of programs a user can run simultaneously depends only on available memory. Real-mode programs, which are written for DOS 3.0, run in a compatibility box that allows them to function but not utilize the inherent OS/2 capabilities such as multitasking, Dynamic Data Exchange and expanded memory.

Clearly, using DOS applications with OS/2 is a makeshift arrangement, but given the current choices, that is the only option for many early adopters. There about 450 products currently shipping that run under OS/2 in protected mode, but that is a meager selection compared with the 20,000 applications available for DOS.

Furthermore, only a small fraction of the OS/2 applications now on the market support the OS/2 Presentation Manager graphical interface.

Yalonis heads The Jupiter Group in Sausalito, Calif., a management consulting firm that assists computer industry clients.

MARTY BRAUN

A number of factors have inhibited the arrival of fully capable OS/2 applications: One is simply that the numbers have not favored an investment. A cardinal rule in PC software development is to develop products for the largest installed bases.

Gary Cole, president of Instaplan Corp., a project management software firm in Mill Valley, Calif., states, "You are either developing software to sell into an installed base or you are developing software for users to do a grand new function with a new hardware and software design. Most developers are in the former category."

Approximately 400,000 units of OS/2 have been shipped to date, but there are 25 million to 35 million copies of DOS in circulation, according to Microsoft, to say nothing of the one million Unix users now working on 300,000 systems.

As long as OS/2 remains character-based, developers have little confidence that the operating system will deliver sufficient differentiation and value to woo users, particularly because of the existing option of using Microsoft Windows with DOS.

Developing and marketing applications for a new operating system is always costly, and with OS/2, software vendors are looking at the necessity of dealing with a whole new set of system calls, including elements for multitasking and expanded memory.

"The development effort to write OS/2 applications can be up to three times the level of effort needed for DOS applications," Cole says.

While DOS has about 30 system calls with which developers design the application's interaction with the operating system, OS/2 has 1,100. There are also specific issues related to the Intel Corp. 80386 processor to consider.

Complex to more complex

Even the arrival of Presentation Manager, the graphical user interface for OS/2 included in OS/2 Version 1.1 and higher, had little immediate effect.

Although the Presentation Manager component with Versions 1.1 and 1.2 makes OS/2's promise more clear, it also presents an even greater challenge for some applications developers.

The development effort required to go from a character-based application to a graphical interface is one of the most difficult development transitions to make in software development. Instead of simple command-based interfaces or typical line menus found in most DOS and OS/2 1.1 applications, developers must contend with pull-down menus, movable, expanding and contracting window interfaces, and Dynamic Data Exchange.

"Redesigning a character-based application to run in a multitasking environment with a

INSIDE

Networks Untangled
Configuring an OS/2 network isn't simple. But with the right setup, you can run critical applications. Page 81.

Product Face-Off
Sybase/Ashton-Tate/Microsoft vie with Oracle in SQL-based data server competition. Page 82.

OS/2

FROM PREVIOUS PAGE

graphical user interface requires almost a transaction processing design mentality," Cole says.

It was not only development difficulties that caused software vendors to hang back; the situation was also complicated by the existence of Windows as an alternative choice for buyers looking for graphical capabilities.

Because Windows offers essentially the same look and feel as Presentation Manager, many users saw no immediate benefit in moving to a new operating system and making a significant hardware upgrade investment, when they could achieve many of the same objectives staying where they were.

Windows does not offer the multitasking capabilities of Presentation Manager; it merely allows other applications to be viewed in background mode. Because it was designed to run in DOS, it also lacks the power potential of OS/2.

However, it was not until recently that users and developers could be sure how far Windows would eventually extend into OS/2 turf. No clear signals were forthcoming from Microsoft and IBM about where Windows would leave off and Presentation Manager begin.

BedLAN

For developers of applications for local-area networks, the situation has been even more confusing. Here, if a developer got as far as a choice for OS/2, he was still confronted with overlapping possibilities in the form of Microsoft's LAN Manager and IBM's LAN Server.

Some of that confusion was alleviated in announcements made by both companies at Comdex/Fall '89.

For developers that thought Windows was encroaching on OS/2, there was reassurance that Windows was not going to move into the OS/2 market in a big way. Windows and DOS, it was explained, will be positioned as the environment of choice for systems with less than 2M bytes of random-access memory and less than 30M bytes of hard disk space. According to the companies, OS/2 and Presentation Manager will be positioned for machines with at least 3M bytes of memory.

Something for something

While IBM gave Windows the nod for the first time, it also made clear that its endorsement included a quid pro quo. Microsoft had agreed that development on Windows would cease after Version 3.0. The environment would not become a bona fide Systems Application Architecture (SAA) system and would not contain features to be built into OS/2, such as distributed processing, the 32-bit flat memory model, multiple threads and extended file names.

Life also became simpler for LAN developers. It was decided to reconcile differences between LAN Manager and LAN Server so that applications developed for one will be able to run with the other. The two products will have identical application programming interfaces, thus simplifying third-party software development efforts.

Finally, the two companies agreed to try reducing the size of OS/2, perhaps down to 2M bytes. In the short term, memory requirements will be reduced from 4M to 3M bytes by allowing users to swap out the DOS compatibility box (allowing DOS programs to run under OS/2 in real mode) and improving the structure of other features.

These announcements came on the heels of an IBM pledge to support LAN Manager. IBM plans to use that technology in OS/2 Extended Edition 1.2 as part of its ambitious Officevision plan, the firm's new suite of proprietary and third-party applications and tools.

Officevision, for which IBM delivered its first applications this past September, establishes an icon-based office environment across all SAA programs. It includes system address, address book, phone book and electronic mail functions. A follow-up release in 1990 is slated to add a document library, calendar, file cabinet and decision support modules.

The sighs have it

Potential users and developers also breathed sighs of relief when IBM announced that its OS/2 Extended, which is a requirement for use of Officevision on a workstation, will be unbundled and sold in parts.

IBM's efforts to push the full functionality of this proprietary version by making it a condition of Officevision had been a cause of considerable concern.

OS/2 Extended has a lot to recommend it; IBM designed it as an integral part of SAA in the role of integrating the company's disparate systems. Its built-in communications and data query facilities make OS/2 Extended a necessity for the kinds of cooperative processing applications that make up Officevision.

OS/2 Extended, which sells for $830, incorporates an SQL-based Database Manager and Communications Manager. The Communications Manager component provides LU6.2 peer-to-peer networking support. The Database Manager can be used to store documents, electronic mail and addresses in relational databases on the workstation or the back-end host computer and runs on a powerful mainframe-like database engine called Database Services.

According to early users, Database Services has good SQL implementation, respectable performance, general compatibility with DB2 and SQL-DS, an advanced locking and logging feature and utilities for optimizing the database.

On the other hand, it lacks some important SQL functionality present in DB2, such as support for primary keys, domains and referential integrity, and is only a single-user system.

The Communications Manager offers a number of communications features normally sold separately from the personal computer operating system. These include file transfer, the LAN Requester, a number of application programming interfaces and 3270 and asynchronous terminal emulation. With this networking support, IBM says OS/2 Extended integrates personal computers into corporate networks.

All or nothing

For the most part, it was not the concept but the all-or-nothing approach and the slow pace of execution that bothered most critics about IBM's handling of OS/2 Extended.

First of all, there was the fact that the product was available only from IBM and would run only on IBM's Personal System/2 line of microcomputers.

Cost was also a concern. Not only does OS/2 Extended cost $490 more than Standard Edition, it also uses more memory. Memory consumption has been a major issue, since implementation of the operating system boosted the random-access memory requirement for Officevision to a minimum of 8M bytes.

Finally, several of the key components have been slow to ship, which has meant that as long as IBM insisted on keeping OS/2 Extended intact as a product, third-party vendors had to either wait for final touches or risk incompatibility.

Many third-party database vendors have delayed introducing any OS/2 products that heavily depend on database functions or the transfer of database files residing in other servers, such as department minis or mainframes.

By unbundling an option, a number of restraints are removed. OEMs may be able to buy and resell portions of the product. The entry point for Officevision will be reduced, which may result in a more rapid market for the product.

Furthermore, potential converts to OS/2 and Officevision or those who simply want some but not all of what OS/2 Extended has to offer will be able to pick and choose what they need more effectively.

For example, unbundling will open the way for broader use of products such as Select Communications Server (Select CS) from Digital Communications Associates, Inc. (DCA). The product, which is scheduled to ship by the end of the year, is intended to support workstation-to-host communications via a server-based gateway on a LAN.

Select CS will fulfill the need for an alternative to the Communications Manager on OS/2 Extended and will be able to run on both IBM Personal System/2s and any other vendor's high-end PC. Select CS is being designed to support OS/2 and DOS on the same LAN, as well as LU6.2 in the server and all of the features of SAA.

Select CS will support more LAN topologies than OS/2 Extended, including Ethernet, Starlan and DCA's 10Net. Select CS is scheduled to ship by the end of the year, according to DCA.

With the air a bit clearer now between IBM and Microsoft and all of IBM's intimations of greater flexibility, prospects

Why Extend yourself?

Several factors influence a decision to select IBM's OS/2 Extended Edition over the basic OS/2 version.

Because of its Communications Manager and LAN Requestor components, OS/2 Extended is likely to be an appealing choice for users who have not settled on one communications software product and for users of IBM mainframe or communications products, Advanced Program-to-Program Communications or EFC.

Database users should determine what OS/2 Extended's Database Manager will add to protected-mode versions of their software and whether they will have file-conversion troubles.

Soon, users will be able to purchase unbundled Communications Manager and Database Manager. Hence, computing environments that do not make heavy use of communications or database programs do not need OS/2 Extended.

WITH THE AIR a bit clearer between IBM and Microsoft and all of IBM's intimations of greater flexibility, prospects for OS/2 appear to be brightening.

Connect the DOS

Some DOS-acclimated users are finding there are ways to get some of the features offered by OS/2 and OS/2 Presentation Manager without making major changes in their operations and applications.

MS-DOS add-ons such as Quarterdeck Office Systems, Inc.'s Desqview and Microsoft Corp.'s Windows/386, for example, run multiple DOS applications in a mouse and windows environment.

Not only have improvements been made and extensions attached to the current DOS operating system, but Windows has been enhanced since its introduction six years ago. Windows/386 now offers simulated multitasking, Dynamic Data Exchange and a consistent graphical user interface without the incremental cost of added working memory and hard-disk space associated with Presentation Manager.

Desqview has a polished, multitasking operating environment and offers virtual memory. Windows swaps only Windows-specific applications; Desqview swaps all programs. Moreover, it offers full crash isolation and automatic serial-port switching and supports expanded memory, whereas Windows/386 does not.

For those who want a true multitasking, multiuser operating system with the familiar feel of DOS, there are choices such as Digital Research, Inc.'s Concurrent DOS and Software Link, Inc.'s PC-MOS, which are complete operating systems and are alternatives to DOS that can read and write MS-DOS files. PC-MOS will accommodate as many as 25 users on a 386 system; Concurrent DOS, up to 10.

for OS/2 appear to be brightening.

Right now, all but 30 of the available OS/2 applications are character-based programs; that is, they do not use Presentation Manager. Only three of the top 20 software companies have shipped Presentation Manager versions of OS/2 products — Microsoft Corp. with Excel, Borland International with Sidekick and Aldus Corp. with Pagemaker.

Other Presentation Manager offerings include accounting software from Timberline Software Corp.; PM Designer, a desktop publishing product from Micrografx, Inc.; SPSS Statistics from SPSS, Inc.; Describeword Processor from Describe, Inc.; and Pack Rat from Polaris Software.

General-business offerings include Officevision from IBM, Net Results from Lifetree Software, Inc. and Timestar 2.0 from Timestar, Inc.

Freckled coverage

Even in the more populous group of character-based applications, coverage tends to be spotty. All told, there are about 80 programs available for accounting from 10 vendors, including Accpac from Computer Associates International, Inc. and Professional Accounting Series from CYMA/McGraw-Hill. For general-business software, there are about 27 products available, including Enable from Enable Software, Superproject Expert/2 from CA and Thinktank from Symantec Corp.

Of the 64 OS/2 products available for communications, 3+Open from 3Com Corp., IBM's OS/2 LAN Server, Microsoft's OS/2 LAN Manager, Net/One from Ungermann-Bass, Inc. and Netware Requester from Novell, Inc. are significant. There are Presentation Manager versions available from 3Com, Cawthon and Xcellenet, Inc.

Few products are currently available in the graphics-intensive area of desktop publishing. However, the fields of science and engineering can claim some 26 programs, mostly from small vendors. In addition, Autodesk, Inc.'s Presentation Manager version of Autocad is expected to ship this month.

As for vertical packages, nearly 80 are available, including ones for banking, leasing, property management and wholesale businesses.

Drought conditions prevail in the area of spreadsheets, with Lotus Development Corp. and Microsoft the only notables shipping OS/2 versions. Microsoft's Excel is the only spreadsheet available under Presentation Manager.

Word processors are sparse as well, with IBM's Displaywrite, Microsoft's Word 5.0 and Wordperfect Corp.'s Wordperfect 5.0 the only big names.

No Presentation Manager products exist yet in the database area. Character-based OS/2 products include Advanced Revelations from Revelation Technologies, Inc., SQL Server Version 1.0 from Sybase/Ashton-Tate/Microsoft and two SQL products from Informix Software, Inc.: Informix-4GL and ESQL.

Other products include Knowledgeman/2 from MDBS, Inc., Oracle Server from Oracle Corp., Paradox OS/2 from Borland, Symantec's Q&A, R:Base from Microrim, Inc. and SQLbase from Gupta Technologies, Inc.

Companies that will compete with IBM's Database Manager SQL product in the client-server category include Sybase/Ashton-Tate/Microsoft with SQL Server, Gupta's SQLbase and Oracle, which sells a database engine for PCs, most minicomputers and mainframes.

In the client-server model, the client or "front end" is usually a PC or workstation, and the server can be a micro, minicomputer or mainframe. In its simplest form, the client asks for information and the server accesses the data using SQL. The server then delivers the data back to the client, along with any other functions it has been programmed to do, such as backup, repetitive tasks and security checks. Ideally, the client-server model reduces the volume of network traffic and shortens response times at the client level by giving the client only the items needed, not an entire block of data or larger tasks.

For users who are evaluating a move to OS/2, character-based products do offer some advantages, principally the ability to run several applications at the same time. However, the cost differential between a DOS and OS/2 version of a program can run as high as 25% to 50%.

Although it is too early to detect a complete change of heart, many of the major developers have announced support for Presentation Manager. Most have been reluctant to commit to specified shipping dates, but one thing is clear, based on the timing of the announcements and the expected level of effort needed to produce a Presentation Manager version: Most of the packages that have been market leaders in the DOS horizontal market segments will also be available for OS/2 in the second half of 1990.

> MOST OF THE PACKAGES that have been market leaders in the DOS horizontal market segments will also be available for OS/2 in the second half of 1990.

Lotus' decision to bypass Windows development in favor of putting development resources into a Presentation Manager version may be the strongest vote of confidence yet. Furthermore, the firm's joint development alliance with Wordperfect for creating OS/2 Presentation Manager applications may point the way for some other developers who have been discouraged by the prospect of bearing the cost and risk of breaking into the OS/2 arena alone.

Lotus and Wordperfect are sharing code for their PM versions to design a more seamless integration between the two applications, which the vendors realize are often used in combination.

Tool vendors say that they are confident that OS/2 application development is about to crank into high gear. There are currently 95 products on the market designed to assist in the development of Presentation Manager applications. These include CASE:PM from Caseworks, Smalltalk from Digitalk, Inc., Easel from Interactive Images, Inc., Applications Manager from Intelligent Environments and Object/1 from Micro Data Systems.

The vision behind OS/2 is clear. It is an operating system designed for a world in which large corporations will depend on a three-tier hardware architecture: the workstation or PC, the server or gateway and the host. In this setting, interprocess communications will be key, and the graphical user interface will need to be device-independent and consistent across all platforms. Furthermore, advanced data-management capabilities, including rich file systems and SQL databases, will be a given.

There is a long way to go before that vision becomes reality, but as we stand at the end of 1989, we may have turned a corner. •

ASK THE VENDOR

We're starting to stick our noses into Advanced Peer-to-Peer Communications (APPC). How do you plan to support APPC with your Easel products for OS/2?

Tom Jobling
Director of marketing
DST Systems, Inc.
Kansas City, Mo.

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Robert P. O'Hara
Senior development manager
Lotus Development Corp.
Cambridge, Mass.

COMMAND TECHNOLOGIES CORP.: Rexx/2 is CTC's OS/2 implementation of Rexx, the IBM SAA procedural language that may be used as an enhanced command language or general-purpose programming language. Rexx/2 can provide macro capabilities for other products, such as SPF/2. It can also interface with several OS/2 subsystems, including OS/2 command, OS/2 application programming interface and Presentation Manager. You can use Rexx/2 instead of OS/2's batch facility for programming ease, increased functionality and compatibility with your mainframe.

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Guesswork is the hard part in OS/2 net configuration

BY AARON BRENNER

At first glance, the issues surrounding OS/2 network configuration do not seem very different from those associated with a DOS network. A network is a network, right?

Wrong. In fact, there is more to consider when you are dealing with OS/2.

To begin with, the OS/2 puzzle is still unfinished; as new versions are released and the pieces fall into place, the operating system's networking capabilities will continue to change dramatically.

When OS/2 Standard Edition 1.2 was shipped in September, it required IBM's LAN Server, Microsoft Corp.'s LAN Manager or another vendor's product to provide even the barest of networking capabilities. Since then, the operating system has received several updates that enhance its networking support, although few users have latched onto them.

One example is The High-Performance File System, which provides quicker disk access by doubling system performance. Another enhancement is the Installable File System interface, which allows vendors to graft their own file systems onto OS/2 without rewriting anything.

This development may encourage network vendors currently incompatible with OS/2 to migrate products to that operating environment. This is good news for users, because it will ease their migration to OS/2. For instance, Novell, Inc. has hinted that while it wants to have a version of its networking software on OS/2, it also wishes to keep its file system intact.

An even more powerful version of OS/2 — Version 2.0, based on the Intel Corp. 80386 chip and due by the middle of next year — will bring to light even more considerations, such as virtual DOS sessions and addressable memory.

OS/2 Extended Edition 1.2, also shipped in September, goes beyond the Standard Edition by including software that connects the workstation to the network right out of the box. The LAN Server is still needed to provide file-server or security capabilities, but with a full client-server application and remote database access capabilities included in the form of Database Manager and Communications Manager, IBM is positioning it as the first step to a complete networking solution.

This is not to say that what IBM or Microsoft offers is the way to go. Other vendors promise network management, better user interfaces and expanded internetworking features. Things get even more complicated when it comes to making a decision about the network operating system to use in conjunction with OS/2.

Brenner is a free-lance writer in New York and author of the book *OS/2 LANs*.

LAN of plenty

The choice of networking software is crucial to the success of any LAN but even more so for OS/2 LANs because of the nature of applications they are likely to support. OS/2's memory capacity, speed and multitasking abilities give it the potential to support applications never imagined on DOS networks.

In fact, there is very little reason to install OS/2 other than as a platform for the building of mission-critical client-server applications. And if you choose the wrong networking software, you risk buying into a platform that cannot support the applications you choose for the OS/2 LAN.

One choice is network software leader Novell's workstation version of Netware that allows OS/2 workstations to run on Netware networks.

However, it is Microsoft LAN Manager-based products such as 3Com Corp.'s 3+Open, Ungermann-Bass, Inc.'s Net/1 and IBM's LAN Server that are dominating the OS/2 networking arena. These are better suited than Netware to support the new OS/2 client-server applications. Also, because LAN Manager is based on OS/2, it runs only one operating system, whereas Netware runs two.

Among LAN Manager-based products, there is a wide range of capabilities.

For example, 3+Open supports Apple Computer, Inc.'s Macintosh, name service and random-access memory-reducing multiple protocols. Or you could go with IBM's LAN Server, which has none of these features but provides domain management — the ability to manage many stations from one personal computer.

> THE CHOICE of networking software is crucial to the success of any LAN but even more so for OS/2 LANs because of the nature of applications they are likely to support.

LAN Manager-based products also differ widely in their ability to support internetworking and multiple protocols. This is a critical consideration because client-server applications typically draw upon data residing on a variety of machines.

Compaq Computer Corp. has just announced plans to sell a stripped-down version of LAN Manager that will not provide any internetworking, while 3Com supports Transmission Control Protocol/Internet Protocol, X.25, IBM's Systems Network Architecture and other networks. IBM and Ungermann-Bass vary in the degree of support they offer as well.

The next versions of LAN Manager-based products, due next year, will add to the choices. LAN Manager 2.0 will support multiple processors in servers, allowing them to run applications usually reserved for minicomputers.

Once all the OS/2 LAN product decisions are made, there is the question of implementation. The biggest hurdle here is expertise. There are only a few systems integrators with the required experience in OS/2 networking, fewer with experience installing OS/2 LAN applications and still fewer who are knowledgeable OS/2 LAN troubleshooters.

The actual installation of OS/2 LAN software is no more difficult than it is for many DOS-based LAN operating systems. When it comes to network configuration and maintenance issues, however, things get a bit more complex.

It is not so much that the software is harder to use, but the larger network and more complex applications running on it complicates issues of security, file access and protocol compatibility.

Some, but not all, OS/2 network operating systems provide the tools needed to manage this complexity. IBM's domain management system and 3Com's Lanview are examples of such tools.

At the moment, most users are staying away from OS/2 networking for the same reason they are slow to convert to OS/2: The unknowns are many, and the certainties are few. In this case, however, much of the current confusion is due to rapid progress.

Once all the cards are on the table, users can more easily judge their hand. For those willing to play with wild cards, the game is in full session. •

ASK THE VENDOR

What are Micro Focus' plans for supporting the development of SAA Cobol applications with Common User Access (CUA) and Presentation Manager front ends?

Steve Rabin
Director of workstation application software
American Software
New York, N.Y.

MICRO FOCUS, INC.: Micro Focus Cobol customers are already creating complete OS/2 Presentation Manager programs using the new Systems Programming Extensions in Micro Focus Cobol/2.

Also, Micro Focus Dialog System is helping programmers create text-based CUA-style user interfaces as front ends to cooperative processing applications.

The next step is to enable any Micro Focus Cobol programmer to create graphical user interfaces (GUI) under Presentation Manager without needing to know the low-level details of Presentation Manager.

A GUI application developed with Micro Focus Cobol and Dialog System will operate under OS/2 or DOS without changes to the application program.

Micro Focus will also continue to emphasize standard, open Cobol solutions by working with IBM and various standards organizations to extend the versatility and usability of Cobol to meet new development challenges.

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Database servers for different terrains

SQL Server and Oracle Server are good bargains for different reasons

BY HAL CHAPEL

PRODUCT FACE-OFF

It's the mixture that personal computer local-area networks have been waiting for: OS/2 multitasking and SQL-based data servers. Gone are the barriers to security, concurrency control, data integrity and failure recovery. With this combination, strategic business applications can be downsized, and the intelligent client-server is suddenly within reach.

Gone also are some major performance barriers. Traditional PC file servers send the entire database to the workstation for query processing; database servers now process, retrieve and protect data, transmitting only the resultant data to the requesting netstation. This frees client PC workstations to concentrate on data presentation and database query without causing major traffic jams on the network cable.

Two leading players in the relational database management system/SQL database market are SQL Server from Sybase/Ashton-Tate/Microsoft and Oracle Server for OS/2 from Oracle Corp. Both products offer powerful SQL server functions. In addition to supporting the ANSI-standard SQL dialect, Oracle Server and SQL Server offer extensions for added functionality.

Both database servers offer multiple levels of security in addition to whatever network security may be present. Because access to the data is from one central server — in contrast to the multiple entry points in previous-generation PC multiuser applications — data security can now be guaranteed.

Although both Oracle Server and SQL Server have identical databases on various other platforms, including Digital Equipment Corp. and Sun Microsystems, Inc., Oracle Server boasts operation on over 80 different hardware platforms.

For controlling database administration functions, SQL Server and Oracle Server offer both command-line and point-and-click interfaces. SQL Server's System Administration Facility and Oracle Server's Server Manager provide administrators and developers with access to database functions, including on-line backup.

A database server is incomplete without some way to develop applications on the front end that access the back-end engine. In this area, Oracle Server proves to be the more mature product, even if only for the short term. The company markets fourth-generation language tools for application development, including forms creation and report writing.

While a few front-end vendors, including Lotus Development Corp. and Borland International, have been enlisted to develop front-end environments for both Oracle Server and SQL Server, roughly 90 have made SQL Server their first priority, Microsoft Corp. said.

Both database servers have programming capabilities for front-end programmers to interface with the server. Sybase's DB-Library is a set of C subroutines for incorporating SQL commands into applications. Oracle Server offers Pro*C, a programmatic C interface. Oracle also makes available interfaces for Fortran, Cobol, PL/1 and Ada.

In many areas, Oracle's product is more highly evolved. It offers better table storage management (tables can reside on any portion of the disk), more extensive monitor tools and a record-locking strategy that prevents read queries from ever locking out a write query.

By contrast with SQL Server's clustered indexing method, which stores data in the ordered level of the index itself, Oracle Server implements clustered tables.

Integrity insurance

There is one area in which SQL Server has a definite advantage, however: its use of stored procedures for ensuring data referential integrity. This feature implements SQL procedural extensions that allow for business rules to be application-independent, binding data with procedures regardless of the front-end application attempting to access or change the data.

Compared with minicomputer and mainframe prices, Oracle Server's $2,499 price tag and SQL Server's $2,495 list price provide an incredible price/performance solution for mission-critical applications.

If platform portability and proven front-end tools are required, then Oracle Server must be given serious consideration. SQL Server's support for application-independent referential integrity may be the answer for other business environments. •

Chapel is president of Vanguard Business Solutions, Inc., a San Francisco-based systems integration and consulting house.

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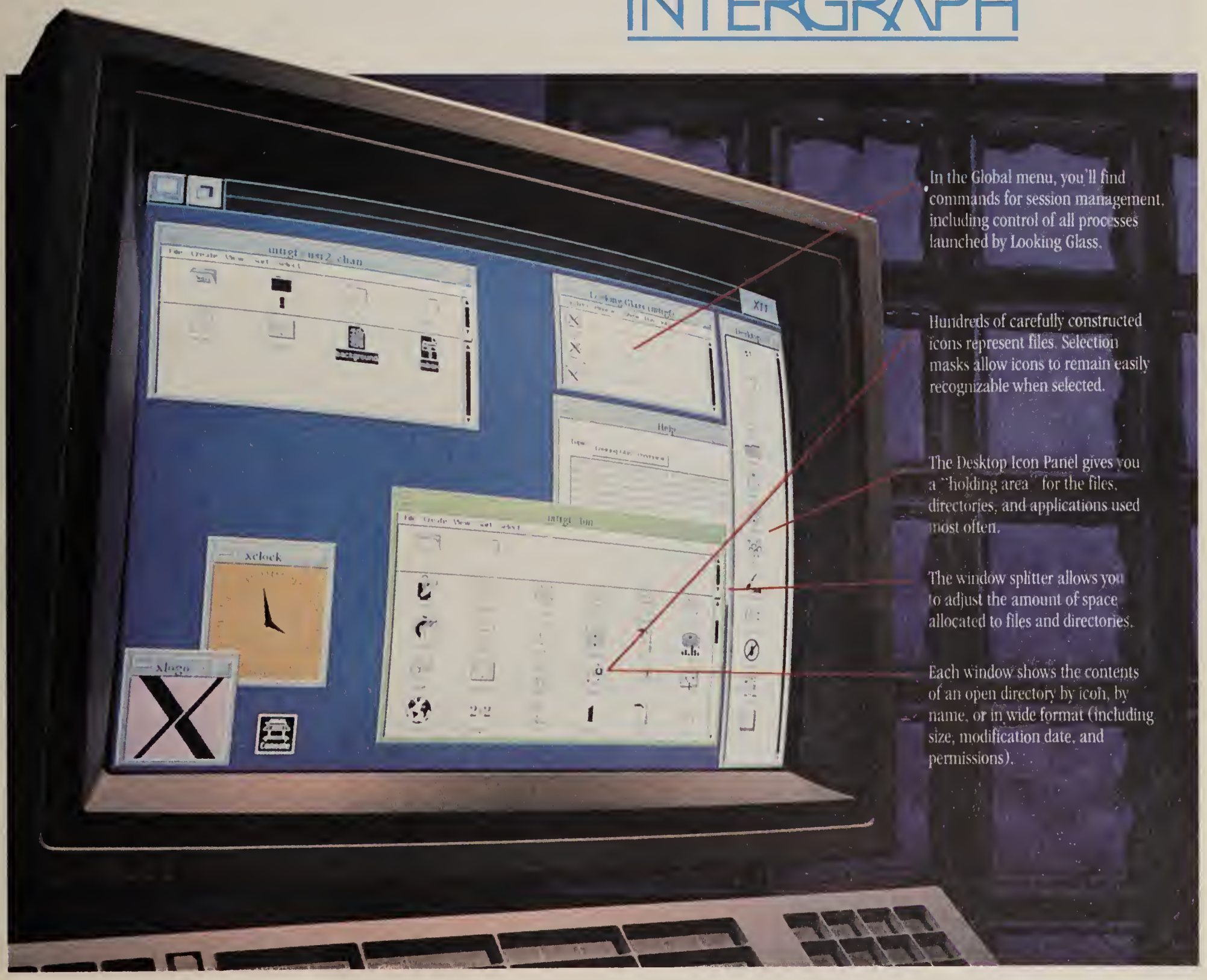

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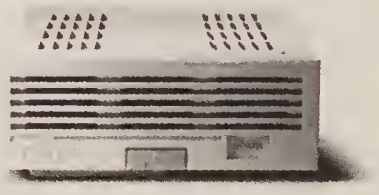

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Released OS/2 business applications

VENDOR	PRODUCT	TYPE OF APPLICATION	RAM REQUIRED FOR INSTALLATION (bytes)	RAM REQUIRED FOR FULL FUNCTIONALITY (bytes)	DISK SPACE REQUIRED FOR INSTALLATION (bytes)	DISK SPACE REQUIRED FOR FULL FUNCTIONALITY (bytes)	VERSION(S) OS/2 SUPPORTED	SUPPORTS BOTH OS/2 AND DOS	SEPARATE DOS VERSION AVAILABLE	CHARACTER-BASED OR WRITTEN FOR PRESENTATION MANAGER	UTILIZES PM WINDOW	RUNS IN REAL OR PROTECTED MODE	AUTO UPDATE ACROSS SESSIONS	FILE/RECORD LOCK ALERT	MULTITHREADING SUPPORTED	NAMED PIPES SUPPORTED	OTHER UNIQUE FEATURES OF OS/2 SUPPORTED	BASE PRICE (DOS VERSION)	BASE PRICE (OS/2 VERSION)
Advanced Business Microsystems, Inc. (800) 999-1809	IBM Platinum Series	Accounting and IS analysis	2M	4M	30M	30M or higher	All	No	Yes	Character-based	Yes	Protected	Yes	Yes	Yes	Yes	Expanded memory	$295-$1,495	$595-$1,995
Aldus Corp. (206) 628-2320	Aldus Pagemaker 3.0 for OS/2 Presentation Manager	Desktop publishing	4M	6M	10M	40M	1.1	No	Yes	Presentation Manager	NA	Real	No	Yes	Yes	No	Imports mainframe graphics	$795	$795
American Small Business Computers, Inc. (918) 825-4844	Scanpro	File conversion	512K	512K	258K	258K	All	Yes	Yes	Character-based	Yes	Both	Yes	No	No	Yes	None	$495 includes both DOS and OS/2 versions	NP
Architech (212) 979-5337	News/2	Graphical user interface	1M	2M	6M	8M	All	No	No	Character-based	No	Protected	No	No	Yes	Yes	VIO subsystem, semaphores	NA	$295 for run-time version, $495 for developer version
Borland International (408) 438-8400	Paradox OS/2	RDBMS	2M	2M	2M	3M	All	No	Yes	Character-based	Yes	Protected	Yes	Yes	No	No	Concurrency, file sharing between sessions	$725	$725
	Sidekick for Presentation Manager 2.0	Desktop organizer	NA (OS/2 swaps memory on demand)	NA (OS/2 swaps memory on demand)	1.5M	1.5M	1.1, 1.2	No	Yes	Presentation Manager	NA	Real	Yes	Yes	Yes	No	None	$200	$200
CC:Mail, Inc. (415) 321-0430	CC:Mail LAN package for OS/2	Electronic mail	350K	350K	250K	250K + data storage	1.0, 1.1	No	Yes	Character-based	No	Protected	Yes	Yes	Yes	No	Background processing	$695	$695
California Software Products, Inc. (714) 973-0440	Baby/36 for OS/2	Application platform	2M	4M	4M	6M	1.0, 1.1, 1.2	No	Yes	Character-based	Yes	Protected	Yes	Yes	Yes	Yes	None	$650 for runtime version, $3,000 for development version	$775 for runtime version, $3,500 for development version
Computer Associates International, Inc. (408) 432-1727	Superproject Expert/2	Project management	2M	2M	1M	1M	All	No	Yes	Character-based	Yes	Protected	No	Yes	Yes	No	None	$695	$795
	Accpac Plus/2	Accounting	2M	2M	640K-1M	640K-1M	All	Yes	Yes	Character-based	Yes	Protected	Yes	Yes	No	No	None	$195-$795	295-$795
D. L. Hiller & Associates, Inc. (313) 247-0394	Factory Data Manager	Manufacturing and data collection	640K	2M	3M	5M	1.0, 1.1, 1.2	No	Yes	Character-based	Yes	Protected	Yes	Yes	No	No	None	$2,995	$3,995
Data Access Corp. (305) 238-0012	Dataflex	DBMS and 4GL	384K	384K	2M	2M	All	No	Yes	Character-based	Yes	Protected	Yes	No	No	No	None	$200	$500
Da Vinci Systems Corp. (800) 326-3556	Da Vinci Email for OS/2	Electronic mail	200K	400K	150K	380K	1.1	No	Yes	Character-based	Yes	Protected	NA	NA	Yes	No	RAM semaphores	$995	$1,495 includes DOS and Windows
Datawright, Inc. (708) 325-9600	Wrightworks	Wholesale distribution system	3M-8M	3M-8M	40M	40M	1.0, 1.1	No	No	Character-based	No	Protected	Yes	No	No	No	None	NA	$800 for application, $5,000 for system
Describe, Inc. (916) 646-1111	Describe M-Word Processor	Word processing	500K	NP	800K	4.5M	1.1, 1.2	No	No	Presentation Manager	NA	Protected	Yes	Yes	Yes	No	None	NA	$595
Dodson Programming Service (817) 723-4481	Legal contingency billing	Accounting	3M	3M	30M	30M	1.0, 1.1, 1.2	Yes	Yes	Character-based	Yes	Protected	Yes	Yes	Yes	No	Spooling	$4,000 - $20,000	$6,000 - $28,000
Enable Software (518) 877-8600	Enable/OA	Integrated software	2M	2M	2M	4M	1.0, 1.1, 1.2	No	Yes	Character-based	Yes	Protected	No	Yes	Yes	No	Serial communications ports	$695	$695
Enable Software/ Higgins Group (415) 865-9805	Higgins	Electronic mail, scheduling and group productivity	2M	2M	2M	2M	1.0, 1.1, 1.2	No	Yes	Character-based	Yes	Protected	Yes	Yes	No	No	None	$695	$695
Enyart Development Corp. (303) 286-8686	Tickler/2	Reminder system	2M	2M	360K	360K	All	No	No	Character-based	Yes	Protected	Yes	NA	Yes	No	Interprocess communication	NA	$80
Golden Bow Systems (800) 284-3269	VQ2	Multifile editor	256K	256K	400K	400K	1.2, 1.1, 1.2	No	No	Character-based	Yes	Protected	No	Yes	No	No	None	$150 includes both DOS and OS/2 versions	$150
Gupta Technologies, Inc. (415) 321-9500	SQLbase Server 4.0	SQL database server	3M	4M	10M	10M	All	No	Yes	Character-based	Yes	Protected	Yes	Yes	Yes	Yes	None	$1,995 for multiuser system	$2,495 for multiuser system
Heuristics, Inc. (916) 369-6606	Onspec for OS/2	Process monitoring and control	4M	8M	4M	12M	Extended Edition 1.1	No	No	Presentation Manager	Yes	Protected	Yes	No	Yes	Yes	Communications manager, expanded memory	NA	$7,800
Humanic Design Corp. (201) 825-8887	Empire/SQL	Human resources management	2.5M	2.5M	10M	10M	1.1	Yes	Yes	Character-based	No	Protected	Yes	Yes	Yes	Yes	Runs under Oracle Server for OS/2 V6.0	$16,000	$16,000
IBM (800) 426-2468, ext 126	Officevision	Office automation	3M	3M	4M	4M	Extended Edition 1.1 and 1.2	Yes	No	Presentation Manager	NA	Protected	Yes	Yes	Yes	No	Communications and Database Managers	$210 for DOS requester	$750
	Displaywrite 5/2	Word processing	3M	3M	25M	25M	1.1	No	Yes	Character-based	No	Protected	No	No	No	No	None	$495	$495

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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TRW has combined its massive homeowner database with direct mail marketing for small businesses. The secret of its success is a 1392 printing system from Kodak.

TRW's Real Estate Market Information group in Colton, California, is offering a new personalized direct mail marketing service for local businesses. Using TRW's powerful new homeowner data and a Kodak Ektaprint 1392 printing system, they're doing things that "just wouldn't have been possible a few years ago," according to marketing services manager Rodger Cosgrove. "We can deliver a product which is professional and cost-effective, yet highly personalized. We can give the local business person more bang for the buck."

TRW combines text and graphics on the system's "WYSIWYG" screen, and prints at up to 92 impressions per minute on the 1392 printer. "It gives blacker text images, better definition and crisper line edges," says Cosgrove, "and in direct mail, that's important." For a complete package of information, call 1 800 255-3434, Ext. 551. In Canada, call 1 800 465-6325.

TRW CREDITS COMPATIBLE PRINTERS BY KODAK

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VENDOR	PRODUCT	TYPE OF APPLICATION	RAM REQUIRED FOR INSTALLATION (bytes)	RAM REQUIRED FOR FULL FUNCTIONALITY (bytes)	DISK SPACE REQUIRED FOR INSTALLATION (bytes)	DISK SPACE REQUIRED FOR FULL FUNCTIONALITY (bytes)	VERSION(S) OS/2 SUPPORTED	SUPPORTS BOTH OS/2 AND DOS	SEPARATE DOS VERSION AVAILABLE	CHARACTER-BASED OR WRITTEN FOR PRESENTATION MANAGER	UTILIZES PM WINDOW	RUNS IN REAL OR PROTECTED MODE	AUTO UPDATE ACROSS SESSIONS	FILE/RECORD LOCK ALERT	MULTITHREADING SUPPORTED	NAMED PIPES SUPPORTED	OTHER UNIQUE FEATURES OF OS/2 SUPPORTED	BASE PRICE (DOS VERSION)	BASE PRICE (OS/2 VERSION)
Informix Software, Inc. (800) 888-7235	C-ISAM	File handler	24K	24K	376K	376K	All	No	Yes	Character-based	Yes	Protected	No	No	No	Yes	None	$225	$225
	Informix-SQL	SQL database	2M	2M	1.5M	1.5M	All	No	Yes	Character-based	Yes	Protected	Yes	Yes	No	Yes	None	$795	$795
Lotus Development Corp. (617) 577-8500	Lotus Agenda 1.01	Personal information manager	640K	640K	1.5M	1.5M	1	Yes	No	Character-based	No	Real	NA	Yes	No	No	None	NA	$395
	Lotus' 1-2-3, Release 3.0	Spreadsheet	1M	1M	2M	2M	1.1, 1.2	No	Yes	Character-based	No	Protected	Yes	Yes	Yes	Yes	None	$495	$495
MDBS, Inc. (800) 323-3629	MDBS IV	DBMS	4M	4M	1M	1M	1.2	Yes	Yes	Character-based	Yes	Real	Yes	Yes	Yes	Yes	Dynamic Data Exchange DDL	$3,900	$3,900
	Object/1	DBMS and development tool	4M	6M	3M	3M	1.2	No	No	Presentation Manager	NA	Real	Yes	Yes	Yes	Yes	Dynamic Data Exchange	NA	$995
MDBS, Inc., K/G Software Division (800) 344-5832	Knowledgeman	RDBMS, 4GL, graphics, report writer	2M	2M	2.6M	5M	All	No	Yes	Character-based	Yes	Protected	Yes	Yes	Yes	No	Dynamic Data Exchange Linked LAN Manager support	$795-$1,995	$995-$1,995
Mansfield Software Group, Inc. (203) 429-8402	Kedit	Text editor	512K	2M	500K	500K	1.0, 1.1, 1.2	No	Yes	Character-based	Yes	Protected	No	No	No	No	None	$150	$175 includes DOS version
Merle Systems, Inc. (617) 282-1846	Order One	Sales analysis	3M	3M	3M	10M	All	Yes	Yes	Character-based	Yes	Protected	Yes	Yes	Yes	Yes	None	$3,500	$3,500
Meta Media, Inc. (404) 892-7921	The Data Gathering System	Communications/Financial	512K	512K	1M	1M	All	No	Yes	Character-based	No	Protected	No	Yes	No	No	Serial port device driver interface	$10,000	$10,000
	ED	Text editor	300K	300K	200K	200K	All	No	Yes	Character-based	Yes	Protected	No	Yes	No	No	None	$75	$75
Michtron, Inc. (313) 334-5700	Michtron BBS 3.0	Bulletin board system	1M	1M	400K	1M	All	No	Yes	Character-based	Yes	Protected	NA	Yes	Yes	NA	None	$80	$80
Micrografx (800) 272-3729	Designer PM	Desktop publishing and graphics	640K	640K	5M	5M	1.2	Yes	Yes	Presentation Manager	Yes	Protected	Yes	Yes	Yes	Yes	None	$695	$695
Microrim, Inc. (206) 885-2000	R:Base for OS/2	DBMS	1M	1M	3.5M	3.5M	1.0	No	Yes	Character-based	Yes	Real	Yes	Yes	No	No	Expanded memory	$725	$895
Microsoft Corp. (206) 882-8080	Microsoft Word for the PC 5.0	Word processing	384K	512K	1M	360K	1.0, 1.1	Yes	No	Character-based	Yes	Both	Yes	Yes	No	No	Expanded memory	$450 includes both DOS and OS/2 versions	NP
	Microsoft Excel for OS/2	Spreadsheet	2.5M	2.5M	3M	3M	1.1, 1.2	No	Yes	Presentation Manager	NA	Protected	Yes	Yes	Yes	No	Dynamic Data Exchange	$495	$495
North Winds (412) 832-9799	Formz	Form processing system	2M	3M	360K	2M	1.1 and higher	Yes	Yes	Presentation Manager	Yes	Protected	Yes	No	No	No	None	$150	$150
Oracle Corp. (800) 672-2531	Oracle Server for OS/2	Database server	8M	8M	30M	30M	All	No	No	Presentation Manager	NA	NP	Yes	Yes	No	Yes	Expanded memory, windowing	NA	$2,499
	Professional Oracle for OS/2	RDBMS and portable tools	1.5M	1.5M	8M	8M	All	Yes	Yes	Character-based	No	Both	Yes	Yes	No	Yes	Expanded memory, windowing	$1,299 for RDBMS and tools, $799 for tools only	$1,299 for RDBMS and tools, $799 for tools only
Peoplesoft, Inc. (415) 946-9460	Peoplesoft HRMS	Human resources management	2M-3M	2M-3M	10M-20M	10M-20M	Server only	Yes	Yes	Presentation Manager	NA	Real	Yes	NA	No	Yes	None	$30,000-$400,000	$30,000-$400,000
Polaris Software (619) 743-7800	Packrat	Personal information manager	2M	3M	750K	750K	All	No	Yes	Presentation Manager	NA	Protected	Yes	Yes	Yes	No	Dynamic Data Exchange	$395	$395
RAM Dynamics, Inc. (201) 837-0550	Orchestrade	Real-time market data acquisition and analysis	4M	4M	1M	1M	1.0, 1.1	No	Yes	Character-based	Yes	Protected	Yes	Yes	Yes	No	None	$1,250	$1,250
Sterling Software, Zanthe Systems Division (613) 727-1397	Zim	DBMS and 4GL	640K	640K	1M	1M	All	No	Yes	Character-based	Yes	Both	Yes	Yes	No	No	None	$1,105	$1,725
Sundial Systems Corp. (213) 596-5121	Now	Time and information management	350K	350K	750K	750K	All	No	No	Character-based	Yes	Protected	Yes	Yes	Yes	No	Expanded memory	NA	$149
Sybase/Ashton-Tate/Microsoft (800) 447-9227	SQL Server	DBMS	6M	8M	20M	30M	1.1	No	No	Character-based	Yes	Protected	Yes	Yes	Yes	Yes	None	NA	$2,495
Symantec Corp. (408) 253-9600	Think Tank	Outliner	512K	512K	600K	600K	1.0, 1.1, 1.2	No	Yes	Character-based	Yes	Both	NA	Yes	No	No	Expanded memory	$195 includes both DOS and OS/2 versions	NP
	Q & A	Database and word processing	2M	2M	1.6M	1.6M	1.0 and higher	No	Yes	Character-based	Yes	Protected	Yes	Yes	No	No	Large memory, multiuser	$349	Free for owners of DOS version via disk exchange program
Time Star Systems (800) 326-4391	Active Life 1.0 for Presentation Manager	Personal information manager	200K	300K	300K	360K	1.2	No	Yes	Presentation Manager	NA	Protected	No	No	Yes	No	Expanded memory	$199	$199
Timberline Software Corp. (503) 644-8155	Property Management Gold	Accounting and management	NP	2M	5.5M	5.5M	All	No	No	Character-based	Yes	Protected	Yes	Yes	Yes	No	Expanded memory	NA	$6,990 - $29,990
Via Information Systems Corp. (609) 243-0433	VIA/DRE	Database server	512K	640K	4M	4M	Extended Edition 1.1	No	Yes	Character-based	Yes	Protected	Yes	Yes	Yes	Yes	CUA, APPC (LU6.2), SAA-compliant, concurrency control	$3,500	$3,500
Wordperfect Corp. (801) 225-5000	Wordperfect 5.0 for OS/2	Word processing	3M	3M	850K	3M	All	No	Yes	Character-based	No	Protected	No	Yes	Yes	No	Dynamic Data Exchange, expanded memory, file sharing between DOS and OS/2	$495	$495

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Switching to improved quality at Florida Power & Light

Quality

FROM PAGE 1

"We have always felt that IS had to be married with the corporate philosophy," says David K. Baldwin, group vice-president and chief financial officer.

Last month, FPL's systems-aided quality improvement efforts paid off in world recognition when it became the first U.S. company to win the annual Deming Prize for quality, an award presented by the Japanese Union of Scientists & Engineers.

For a company that produces electric power, quality might appear to be an intangible. At FPL, the IS department has worked with users to design systems that track quality indicators — an approach pioneered by Deming and enthusiastically adopted by Japanese management for the past four decades. "There are ways to measure everything: Some are more difficult, some are less precise," says Al Horner, FPL's manager of information planning, systems and programming.

Since 1983, the utility — which in 1988 had $4.6 billion in operating revenue — spent $75 million on systems development and will spend another $17 million this year. Although FPL has met its goals for the quality program and has won the Deming award, there is no time to rest on its laurels, says Director of Systems and Programming Donald F. Borgschulte. Quality improvement "is never finished," he says. "It won't change as rapidly as it has over the last five years, but it won't stop."

ALL PHOTOS BY GARY S. ROSENFELD

Jack Gomm
Director of divisions planning and administration

"We can also look at the typical problems and start to predict where potential problems might occur. That can help us to prevent interruptions."

Thanks to its quality program, FPL has made impressive strides toward improving customer service. In 1984, the Florida Public Service Commission received 2,100 service and billing complaints against FPL; the number has declined to just 900 last year, according to commission spokeswoman Joey Kelly. In 1989, complaints about FPL are running 13% to 16% lower than last year, Kelly added.

Less to complain about

Much of the drop in complaints can be directly correlated with improvements made by IS. For example, the IS department helped to create the Trouble Call Management System (TCMS), a cross-functional system that tracks power outages and other customer problems.

With the manual system that preceded TCMS, there was a 30-minute delay between the time a customer called FPL to report a problem and the issuance of a repair order. Today, the time has dropped to six minutes, says Bill Peery, manager of divisions systems, divisions planning and administration.

The average time an FPL customer is without electrical service has dropped from 100 minutes per year in the early 1980s to 48 minutes per year today. QIP has also reduced the number of unplanned days offline for FPL's nuclear units, which dropped by 57% in 1988 compared with 1987.

Also, TCMS generates important data for FPL service managers, which helps prevent future trouble based on their analysis of past problems. TCMS analyzes all incoming calls, grouping them geographically and directing repair crews to the likely source of the problem.

"We can look at the typical

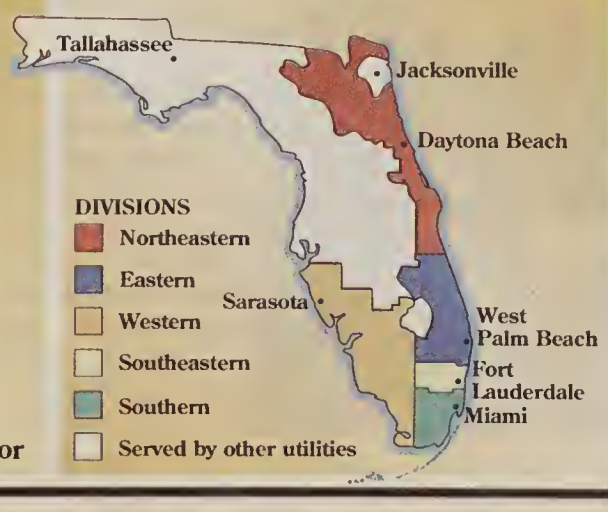
Continued on next page

At A Glance

Florida Power & Light

- Sales ..... $4.63 billion
- Employees 15,000
- IS employees 600
- Customer accounts ..... 3 million
- Director of systems and programming ..... Donald F. Borgschulte
- IS budget ..... $60 million
- Key systems ..... 3 IBM 3090 Model 600Es, 13,000 terminals and printers, 3,000 PCs.
- Host operating systems ..... IBM MVS/ESA and VM/HPO (converting to VM/XA)
- Database software ..... IBM DL/1 and DB2
- Development software ..... Information Builders' Focus; Proton, an internally developed Cobol generator

FPL service area



Take it from the top

When key executives get behind quality improvement, things go more smoothly

BY CAROL HILDEBRAND
CW STAFF

Facing the vast task of implementing quality improvement procedures at Florida Power & Light must have been similar to the dilemma facing Moses when he staggered down from his mountaintop tete-a-tete: "I've got a great concept here, but how do I get everyone else to follow along?"

It always helps when the inspiration flows from the top, as it did in the case of FPL. Marshall McDonald, the utility's former chief executive officer, initially became interested in quality improvement in the early 1980s, following a three-week visit to Kansai Electric Power Co., which is one of Japan's largest utilities.

McDonald was impressed enough to be convinced that the same techniques could be of great value to his own organization.

The challenge facing FPL's top management was to convince employees to march to the quality improvement program (QIP) beat, according to Chief Financial Officer David K. Baldwin. "People wanted to skip QIP steps and go directly to a result, but [quality improvement] is more of an evolutionary process," Baldwin explains.

Teaming up for quality

FPL started by encouraging the formation of quality teams — worker-led groups assembled to identify and solve specific problems using QIP techniques. Top management also continued to visit Kansai, setting up a cross-training program and garnering QIP advice from Kansai consultants.

According to Jose M. Bestard, FPL's vice-president of corporate planning, "The Japan trips and return visits made a vast overall impression that quality assurance completely pervades the Japanese way of life."

FPL encountered some resistance from middle management, who found themselves caught between fired-up executives and worker-led QIP teams. "Middle managers wanted to know why they had to change and why they had to abandon what they had known. They wanted it to be proven to them that it would work. They were the biggest problem," Bestard says.

Middle-level training

This opposition resulted in a massive middle-management training program and gradual acceptance of QIP.

According to FPL officials, training was one of the most crucial factors in QIP implementation. Structured QIP methodology took a very different tack from the more freewheeling American style of innovation through brainstorming. "A strong training program definitely helps to alleviate culture shock," Baldwin says.

Abel Szulszteyn, an FPL systems supervisor, says that middle management's early resistance was a result of unfamiliarity with both the program and the tools. Moving to QIP was "a complete change of philosophy," he says. "We emphasized training in QIP. Once we got to know how to use the tools, it became very simple to go in there and do things." •

David K. Baldwin
Chief financial officer

"People wanted to skip Quality Improvement Program steps and go directly to a result, but quality improvement is more of an evolutionary process."

Quality

FROM PREVIOUS PAGE

problems and start to predict where potential problems may occur. That can help us prevent interruptions," says Jack W. Gomm, director of divisions planning and administration.

For example, continual monitoring showed that lightning was the main cause of service interruptions. Florida has the highest incidence of lightning in the U.S. Before TCMS, the problem might have been downplayed. But using the performance indicators and QIP techniques, the problem was probed further. Investigators discovered that transformers were inadequately grounded. "Now we have better grounding through QIP techniques," Gomm says, and fallen trees have replaced lightning as the No. 1 cause of outages.

"I haven't seen many organizations go to that kind of depth in using information to track critical indicators," says Sam Miller, a senior associate at Index Group, Inc. in Cambridge, Mass. FPL has "changed its culture by using technology to measure critical success factors. They decide what they want to achieve, then they actually establish measures and use IT to track them, even at very low levels," Miller adds.

Miller recently accompanied an Index client from the utilities industry on an FPL visit to learn more about IS and quality issues.

FPL has a strong reputation among utilities for its quality program, says Ralph Palmigiano, director of IS at Edison Electric Institute (EEI), a trade association for investor-owned electric utilities based in Washington, D.C. "We see [FPL] as an industry leader; they have also helped the EEI establish its own quality improvement program," he says.

Quality improvement "creates a very, very good source for user input and direction" of computer systems, Palmigiano says. "What you're seeing, not only at FPL but at other utilities as well, is a way to increase productivity without increasing costs — and one of the ways to do that is to take ongoing functions and automate them to save people time and reduce errors."

> THE JAPANESE put a great deal of emphasis on quantitative measures and look for ways to represent complex information graphically.

Once a month, FPL holds a day-long orientation in Miami to show up to 100 people how FPL works. Currently, the waiting list extends to February 1990. FPL has also established an outside subsidiary, called Qualtec, which sells quality improvement consulting services.

Further evidence of FPL's "systems mentality" is its cross-functional, 10-member Systems Development Screening Committee. The committee helps departments that want new computer systems decide whether the IS group or the department should pay for the technology.

The advent of readily available data and the use of Japanese methodologies at FPL has also changed management attitudes. "Our old philosophy was, 'I'm a customer, too — I know what is important,' " says Jose M. Bestard, vice-president of corporate planning at FPL and a screening committee member. "But now we do much more research on what is important for our customers. We look at their needs."

As a culture, Bestard says, the Japanese put a great deal of emphasis on numbers and quantitative measures and look for ways to represent complex information graphically.

FPL's information systems employees work with users to create systems that allow them to easily make the graphs they need — and the resulting charts adorn the walls of virtually every department inside FPL.

Down to zero

Each chart represents a number of "indicators" that are checked over time. If an indicator moves up beyond a predetermined threshold, countermeasures are put in place to bring them down — ideally to zero.

A seven-step quantitative process is followed for every project, and much of the historical data and numerical information is tracked through computer systems. But knowing the right indicator to track to reach a particular objective — say, a reduced number of errors in a software release — can be tricky.

This is where "quality teams" come in. Looking at data collected by the systems over a period of weeks or months, team

Continued on next page

Information systems anchor the entire organization

Information systems are the backbone of FPL's quality improvement program. The following are descriptions of four of the most important cross-functional systems:

• **Divisions Management Information System (DMIS).** Using 101 standardized indicators, the system collects and analyzes customer survey and check-sheet data from all divisions. Users can look at all levels of indicators to find the root of a problem and correct it before it becomes a high-level indicator. Such indicators include timely responses and considerate customer service.

An on-line component of DMIS is available to all users within the company, allowing FPL's five geographic divisions to monitor one another's quality progress. A division faring poorly in one area can then approach a division that is doing well to find out what it is doing wrong.

• **Trouble Call Management System (TCMS).** This lets customer service representatives locate electrical problems or outages, based on complaint calls, and then alerts repair crews. TCMS also allows technicians to predict, based on historical data, where future problems could possibly occur.

• **Distribution Construction Management System (DCMS).** This allows users to estimate labor and material costs for the 150,000 work orders the utility processes annually. DCMS allows a standardized budgeting process across FPL's more than 400 locations, which formerly had little access to common data across the company for budget planning assumptions. It also eases crew scheduling to meet customer requirements.

• **A future system.** The largest IS project at FPL is the recreation of the massive customer information system that holds data on the utility's 3.2 million subscribers. The basic rewrite of the system, expected by 1992, will take 240 to 280 man-years of work, FPL systems executives estimate.

After migrating the information system to IBM's DB2, FPL will be able to send aggregate bills to customers with multiple locations. One supermarket chain with 120 stores in FPL's territory currently gets 120 electric bills.

Quality in IS: Managing with facts, not intuition

BY ELLIS BOOKER
CW STAFF

Can rigorous quality control techniques — the kind used in a Sony Walkman factory — improve the output of a software development team or make an information systems department more responsive?

Florida Power & Light thinks so. Years ago, the Miami-based utility adopted a common set of statistical quality-control procedures for all of its departments, including IS.

The result has been better software code and more satisfied internal users, according to officials in FPL's Information Systems and Services (ISS) group.

"We manage with facts, not intuition," says Donald F. Borgschulte, FPL's director of systems and programming. This approach has made FPL a pacesetter among U.S. companies and a standout even when compared with Japanese firms, according to analysts.

Japanese-style quality "manufacturing techniques are *not* applied to software in Japan," says Vaughan Merlyn, chairman of Bellevue, Wash.-based CASE Research Corp.

Al Horner
Manager of information planning

"There are ways to measure everything: Some are more difficult, some are less precise. We have always been able to quantify customer satisfaction."

members can see irregularities or aberrations in the data they collect. Some of the data enters the user's system through other systems within FPL, some comes from checksheets and some from surveys, says Don Paxson, supervisor of divisions information services.

Every variation that shows up in any of the company's carefully orchestrated charts and graphs is scrutinized closely. "We can look to the root of a problem to correct it before it becomes a high-level indicator," Paxson says. All indicators are measured from the customer perspective — whether that customer is internal or external, he says.

The newest systems being developed by the IS department will track a number of quality indicators automatically. Systems are also used to help facilitate communications between different departments within FPL and among FPL's 13 power plants and six operations offices throughout Florida.

In all, there are 1,700 quality teams working within FPL; a Quality Management Information System is used to help members manage their time.

To gauge customer needs, FPL has spent heavily on market

Continued on page 100

A total effort

The success of the ISS group, Merlyn says, rests on FPL's organizationwide approach to quality. "An enterprise that has entered a total quality program will be far more amenable to applying these techniques to its software," he concludes.

U.S. IS departments, Merlyn says, continue their obsession with "productivity improvement and doing more for less," thus missing the fundamental role of quality improvement.

Al Horner, FPL's manager of information planning, admits that statistical methods are difficult to apply to applications development, which, unlike manufacturing, does not involve clearly defined steps performed over and over again. However, he says that his IS group is working on the problem. Along with traditional performance measures, such as tracking the percentage of production errors or the number of missed release dates, the group is starting to monitor systems objectives.

That assessment, performed with users before a single line of code has been written, reflects the second aspect of QIP: customer-orientation. User satisfaction is monitored with annual surveys and interviews. Even the humble IS Help desk is monitored. One chart reads, "Percentage of customer calls requiring consultant callback not returned within one hour."

For purposes of clarity, all studies feed into three primary indicators: business systems unavailability, transaction response time and processing capacity — which are tracked by management. Cross-functional management teams watch these indicators, institute corrections when needed and look to achieve future quality targets. One such target is to reduce the annual average downtime for the on-line Trouble Call Management System from 22 minutes this year to 15 minutes next year.

According to Horner, IS energy is expended on fixing leaks, not finding them: "We don't send teams looking for problems. The problems will show through the data," he says.

Monitoring is nothing new to network engineers. But under the rigors of QIP, John E. Paul, manager of the FPL telecommunications network, it has taken network management to new heights. Paul says he knows what he wants to monitor on his 111-node network of voice, data and video but lacks the network management tools to do it.

He would like to break out the types of application traffic going around the network, a capability he does not now have. The issue is being pressed because during the next 12 to 18 months, FPL hopes to build gateways from its IBM Systems Network Architecture network to the company's 20 or so local-area networks.

As one part of a solution, Paul says FPL is looking to consolidate its modem network management system with IBM's Netview. He claims that the FPL network, which runs 1.4 million transactions daily, has an unavailability rate of 0.07%, actually below the target of 0.01%.

Selling the QIP to the 600 employees in ISS wasn't easy at first. Top managers were enthusiastic about QIP as early as 1985, Borgschulte says. But middle managers a notch or two lower regarded the structured methods as makework, "an extra thing to do." Some resisted QIP's highly structured way of analyzing and solving programs.

Ironically, "The people who resisted the structured method were hot on computer-aided software engineering," Horner says.

Borgschulte says a massive training effort that began in late 1985 turned the tide. The FPL development staff had used a variety of software tools, Horner recalls, from word processors to mainframe document processors. In late 1986, FPL tried to consolidate IS efforts under Multicam, a single software platform that is a CASE development tool from AGS in King of Prussia, Pa.

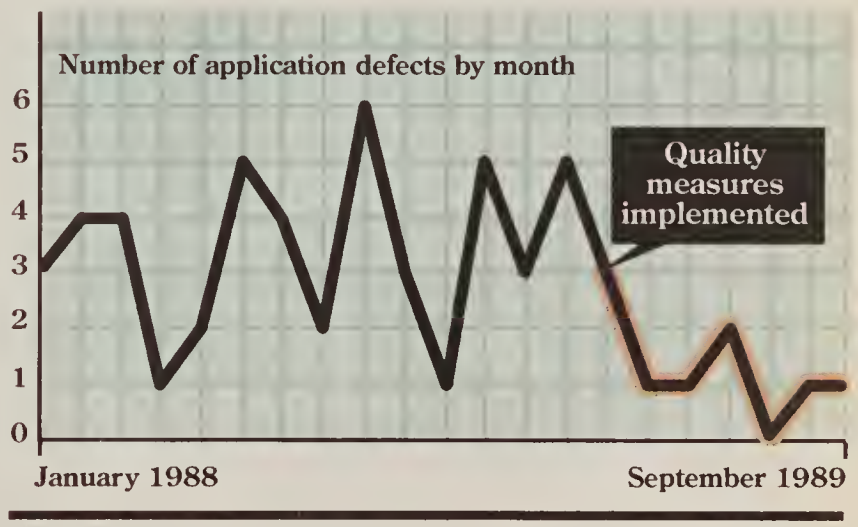
But that attempt failed, Horner says: "Ultimately, we became flexible and didn't require them to use Multicam. We said they could use Wordperfect or their pencils if they wanted." Such inconsistencies were less important than a common methodology, which Horner says he believes the department has achieved. Further, he notes, an increasing number of the staff are now moving to Multicam.

FPL is carefully entering the CASE waters. Six months ago, it brought in a dozen workstations on a pilot of Knowledgeware for two or three applications.

At the same time, FPL has been working with Andersen Consulting and has begun using Andersen's project management methodology and design tools. Even so, it continues to use Proton, a 6-year-old, in-house developed code generator. •

Software quality by the numbers

Fewer defects in FPL's Procurement Management Information System application prove the power of QIP



SOURCE: FLORIDA POWER & LIGHT CO. CW CHART: JOHN YORK

For programmers, a night's sleep

Personal satisfaction, recognition from your peers and a pat on the back from the boss are all nice. Then again, so is sleeping through the night.

For workers at FPL, the QIP program and the work groups formed through it provide all of those incentives.

"There is a motivational factor in being able to work on what you want to work on; seeing your ideas implemented is the biggest motivator of all," says David K. Baldwin, FPL's chief financial officer.

Brenda Bryant, FPL's applications specialist for payroll and personnel systems, says that the problems addressed by her team have made life less complicated.

Bryant's work group has focused on improving the runtime of the payroll system. Previously, the payroll was run during the night, but now, it usually starts running before Bryant and her co-workers leave for the day.

Bryant and her fellow programmers are on call 24 hours a day. If there is a problem at 3 a.m., someone has to come in to work on it.

"Now that the payroll runs faster, it is usually running before we go home; by the time we leave, we've passed the critical point," she says.

"Pre-QIP, we had problems, and we reacted to them," says Abel Szulszteyn, systems supervisor of financial and personnel systems and programming. "Now, we try to prevent them before they happen. We spend our time up front."

ALAN J. RYAN

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STANDARD FEATURES:

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- Choice of 1 MB, 2 MB or 4 MB of RAM* expandable to 16 MB (using a dedicated high-speed 32-bit memory slot).
- Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM cache.
- Page mode interleaved memory architecture.
- VGA systems include a high performance 16-bit video adapter.
- Socket for 25 MHz Intel 80387 or 25 MHz WEITEK 3167 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Dual diskette and hard drive controller.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 200-watt power supply.
- 8 industry standard expansion slots (6 available).

***Commercial Lease Plan.*
Lease for as low as $153/month.
ΔXerox Extended Service Plan pricing starts at $370

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100 MB VGA Color Plus System	$5,099
100 MB Super VGA Color System (800 x 600)	$5,199
150 MB Super VGA Color System (800 x 600)	$5,699

Prices listed reflect 1 MB of RAM. 322 MB hard drive configurations also available. 4 MB versions available for an additional $600.

**Performance Enhancements: Within the first megabyte of memory, 384 KB of memory is reserved for use by the system to enhance performance.*

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- Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM cache.
- Page mode interleaved memory architecture.
- VGA systems include a high performance 16-bit video adapter.
- Socket for 25 MHz Intel 80387 or 25 MHz WEITEK 3167 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Dual diskette and hard drive controller.
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- 8 industry standard expansion slots (6 available).

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100 MB Super VGA Color System (800 x 600)	$5,199
150 MB Super VGA Color System (800 x 600)	$5,699

Prices listed reflect 1 MB of RAM. 322 MB hard drive configurations also available.

THE NEW DELL SYSTEM® 316LT

This new full-featured, battery powered 386SX laptop costs less than most 286 laptops.

STANDARD FEATURES:

- Intel 80386SX microprocessor running at 16 MHz.
- Choice of 1 MB or 2 MB* of RAM expandable to 8 MB (on the system board using 1 MB SIMMs).
- LIM 4.0 support for memory over 1 MB.
- Adjustable and detachable 640 x 480 VGA Liquid Crystal Display.
- One industry standard half-size 8-bit expansion slot.
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20 MB, 1 MB RAM	$3,499
20 MB, 2 MB RAM	$3,699
40 MB, 1 MB RAM	$3,799
40 MB, 2 MB RAM	$3,999

For a limited time, get a free battery pack with your purchase.

***Performance Enhancements: Within the first megabyte of memory, 128 KB (316SX, 316LT and 210), 384 KB (325) of memory is reserved for use by the system to enhance performance. Can be optionally disabled on 316SX and 210. 4MB configurations available on all systems. Call for pricing.** All systems are photographed with optional extras. All prices and specifications are subject to change without notice. Dell cannot be responsible for errors in typography or photography. **Payments based on a 36-month, open-end lease. Leasing arranged by Leasing Group, Inc. In Canada, configurations and prices will vary.

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1. Which products are you most interested in?
   A ☐ 286-based systems
   B ☐ 386™-based systems
   C ☐ 386SX-based systems
   D ☐ UNIX-based systems
   E ☐ Laptops
   F ☐ Other
2. Are you interested in computer products for:
   A ☐ Home B ☐ Business
3. How many PCs do you (your company) plan to purchase in the next twelve months?

Timeframe	Quantity
A ☐ Less than 1 month	_____
B ☐ 1-3 months	_____
C ☐ 3-6 months	_____
D ☐ 6-12 months	_____
E ☐ More than 12 months	_____

4. How many PCs do you have installed now? _____
5. Are you a (select one):
   A ☐ End user
   B ☐ Consultant
   C ☐ Resellet
   D ☐ Corporate Purchaset
   E ☐ DP/MIS Purchaser
   F ☐ Government Purchaser
   G ☐ Other: _____

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THE NEW DELL SYSTEM® 316SX
16 MHz 386SX.

The perfect low profile mainstream computer, combining 386SX power and compatibility with unprecedented value and support.

STANDARD FEATURES:

- Intel 80386SX microprocessor running at 16 MHz.
- Choice of 512 KB, 640 KB, 1 MB or 2 MB* of RAM expandable to 16 MB (8 MB on the system board).
- Page mode interleaved memory architecture.
- LIM 4.0 support for memory over 640 KB.
- Integrated diskette and high performance 16 bit VGA video controller on system board.
- Socket for Intel 80387SX math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Integrated high performance hard disk interface on system board.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 3 full-sized 16-bit AT expansion slots available.

Commercial Lease Plan. Lease for as low as $72/month.

△***Extended Service Plan pricing starts at $187.***

20 MB VGA Monochrome System	$1,899
40 MB VGA Color Plus System	$2,399
40 MB Super VGA System (800 x 600)	$2,499
100 MB Super VGA System (800 x 600)	$3,099

Prices reflect 512 KB of RAM. 640 KB versions of the above systems are available for an additonal $50, 1 MB versions for an additional $150, and 2 MB versions for an additional $300.

THE DELL SYSTEM® 210
12.5 MHz 286.

The price says it's an entry-level system. The performance says it's a lot more.

STANDARD FEATURES:

- 80286 microprocessor running at 12.5 MHz.
- Choice of 512 KB, 640 KB, 1 MB or 2 MB* of RAM expandable to 16 MB (6 MB on the system board).
- Page mode interleaved memory architecture.
- LIM 4.0 support for memory over 640 KB.
- Integrated diskette and high performance 16-bit VGA video controller on system board.
- Socket for Intel 80287 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- Integrated high performance hard disk interface on system board.
- Enhanced 101-key keyboard.
- 1 parallel and 2 serial ports.
- 3 full-sized 16-bit AT expansion slots available.

Commercial Lease Plan. Lease for as low as $61/month.

△***Extended Service Plan pricing starts at $158.***

20 MB VGA Monochrome System	$1,599
20 MB VGA Color Plus System	$1,899
40 MB VGA Monochrome System	$1,799
40 MB VGA Color Plus System	$2,099

Prices listed reflect 512 KB of RAM. 640 KB versions of the above systems are available for an additional $50, 1 MB versions for an additional $150, and 2 MB versions for an additional $300.

100 MB hard drive configurations also available.

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7) If you could make any changes or improvements to our products, what would they be? (Please list your top three suggestions)

Just keep lowering your prices (28–30)

7) If you could make any changes or improvements to our products, what would they be? (Please list your top three suggestions)

Reduce Cost (28–30)

7) If you could make any changes or improvements to our products, what would they be? (Please list your top three suggestions)

Sell them at an even lower price (28–30)

7) If you could make any changes or improvements to our products, what would they be? (Please list your top three suggestions)

Drop the price ! (28–30)

7) If you could make any changes or improvements to our products, what would they be? (Please list your top three suggestions)

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As for the System 325, it's a true thoroughbred. Running on either Microsoft® MS-DOS,® MS®OS/2, or our Dell UNIX® System V, which is compatible with AT&T System V Interface Definition. And XENIX.®

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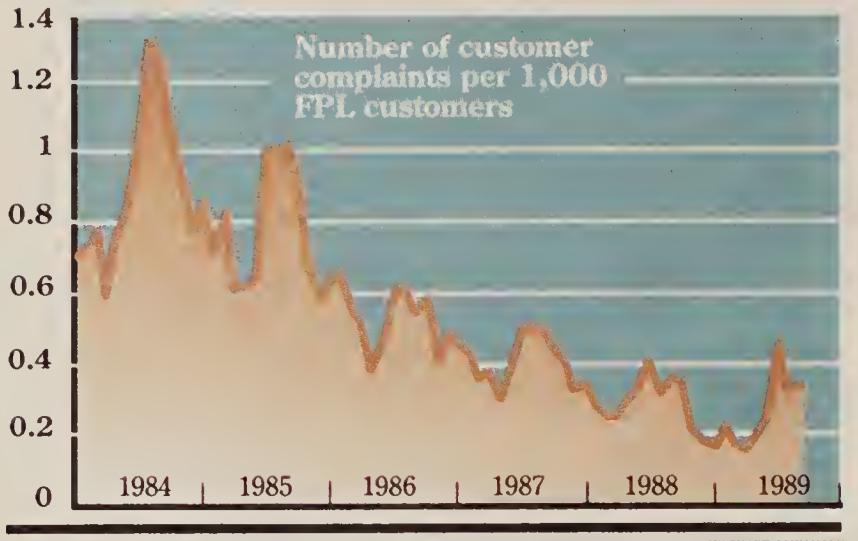
Quelling consumer gripes

The number of FPL consumer complaints to the Florida Public Service Commission has been on the decline since 1984



SOURCE: FLORIOA POWER & LIGHT CO. CW CHART: JOHN YORK

Quality

FROM PAGE 97

research, including customer focus groups and demographic studies. One survey showed customers want to know when power will be restored.

To meet this need, FPL is piloting an "estimated time of repair" system. Using data from the repair crew, operators can tell customers when they will have their service back.

All of the systems were designed to make life easier for the user. "We want to help users do things for themselves," Borgschulte says. "Significant resources are devoted to end users writing their own programs."

Some 50% of the capacity of an IBM 3090 Model 600 is dedicated to Information Builders, Inc.'s Focus applications — all written by users.

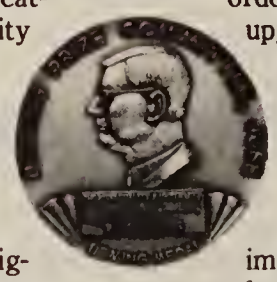
"They've done a lot to educate their users," says Index's Miller. "They've built a very good support link and seem very far along the curve on that." •

Midwest correspondent Ellis Booker and Senior Editor Clinton Wilder contributed to this story.

The Deming Prize: No longer a stranger at home

It is ironic that Japan's most prestigious quality assurance award, the Deming Prize, honors an American — W. Edwards Deming, a U.S. statistician and quality control expert.

Deming's work in statistical quality measures created a devotion to quality control that has become ingrained in Japanese industrial culture. Until recently, however, Deming's thinking has been largely ignored in his native country — and his namesake prize has eluded U.S. companies until FPL made history by winning the Deming Prize last month.



Established in 1951 by the Japanese Union of Scientists and Engineers, the Deming Prize is awarded to organizations that demonstrate a successful, companywide quality control program.

The award has helped establish total quality techniques in nearly every aspect of Japanese industry. Many Japanese organizations enter the grueling application procedure in order to streamline and upgrade internal quality procedures to a level worthy of securing the award. This nationwide acceptance has resulted in the massive improvements in manufacturing quality that have helped Japanese industry take giant strides in the global market.

The Deming is awarded in three categories: for Japanese individuals, Japanese organizations and overseas companies. The third category was established in 1986 in response to growing non-Japanese interest in quality.

FPL was inspired by Japan's Kansai Electric Power Co., the first service firm to win a Deming in 1984. FPL decided to launch an all-out effort to win the prize after current CEO John J. Hudiburg and a team of FPL managers visited Kansai and other Japanese firms several years ago.

According to Donald F. Borgschulte, FPL's director of systems and programming, completing the grueling challenge process was satisfaction enough.

"Just being in the competition vastly improved the company's quality improvement process," Borgschulte said.

"The challenge for the Deming Prize has accelerated a new management process from two years to 6-10 months. The outcome was almost irrelevant."

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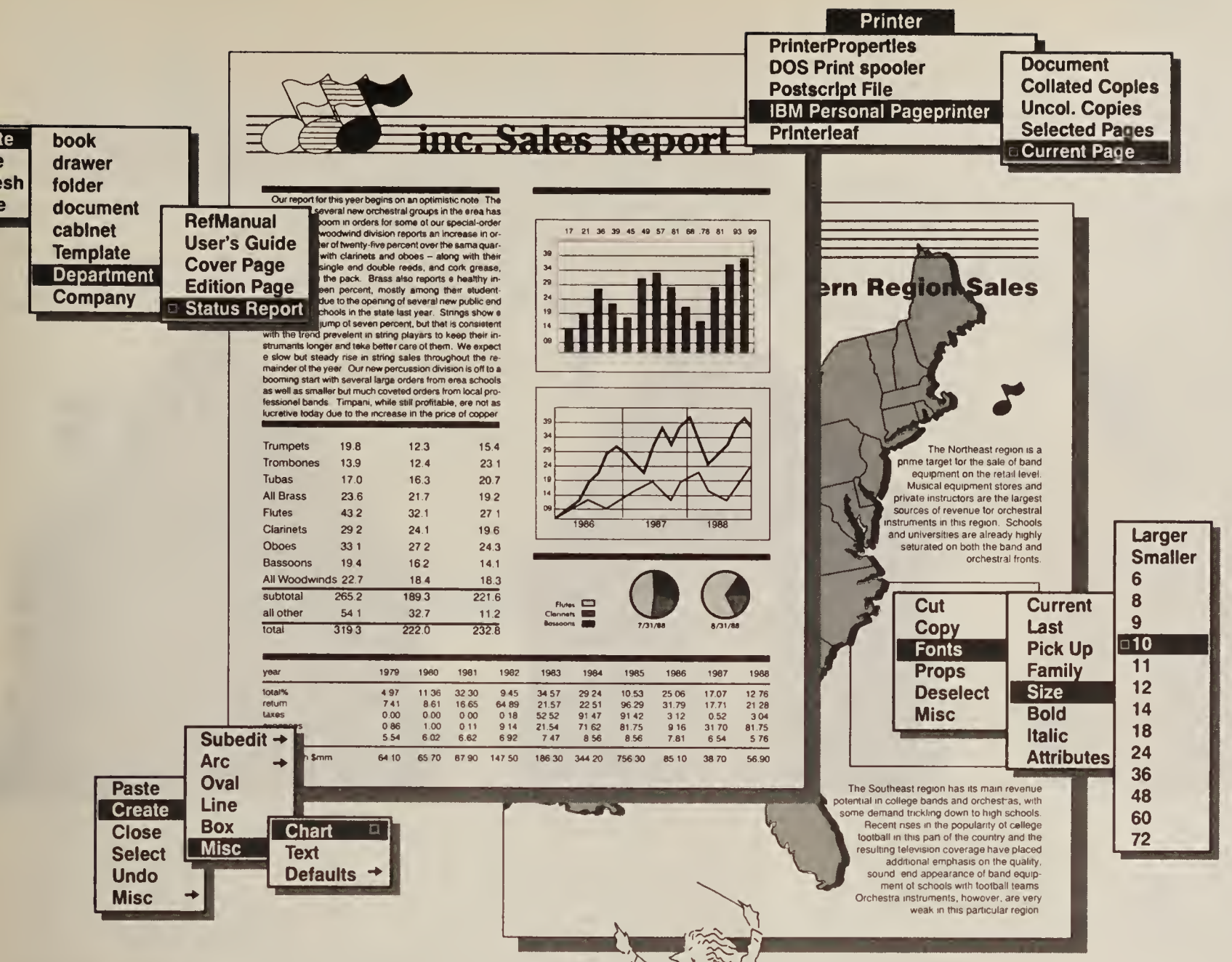

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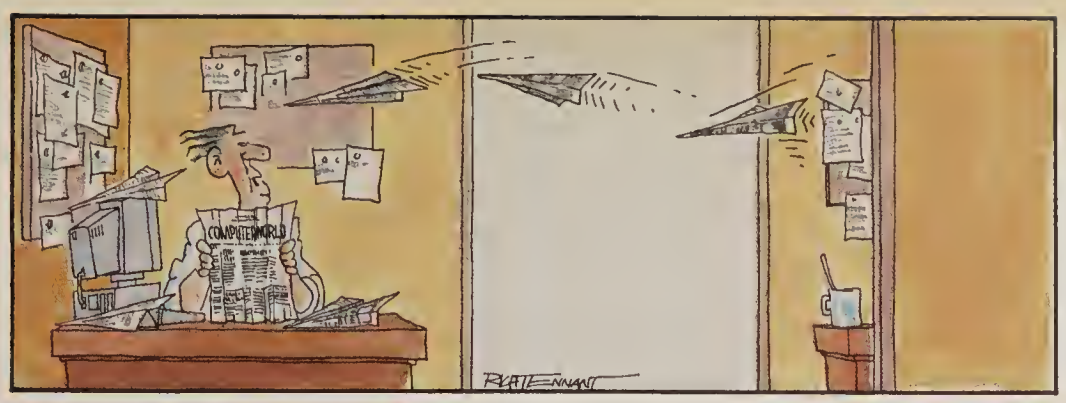

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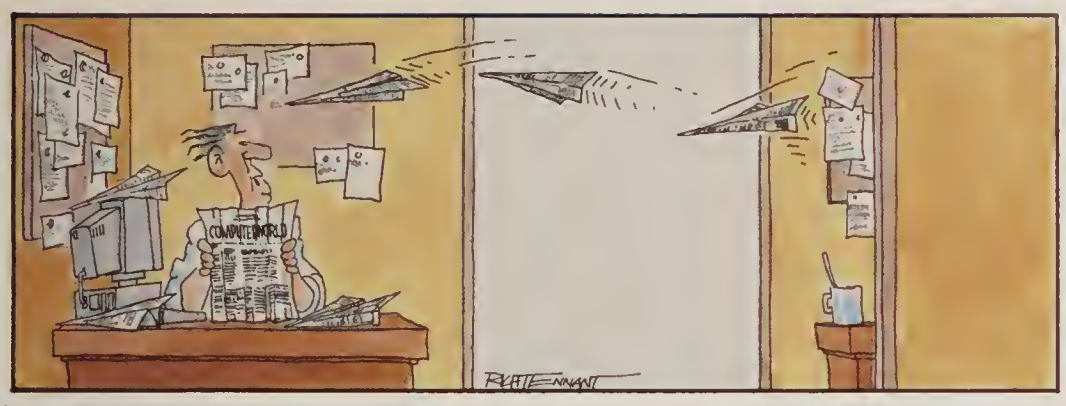

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   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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INDUSTRY INSIGHT

Glenn Rifkin

Writing the book of Jobs

It must be fun to be Steven Jobs. Here's a guy who has achieved the status of a major rock star, but instead of guitar, he plays the heartstrings of American business. He is brash but charming, stylish but brilliant and simply impossible to ignore.

The man is not yet 35, and it seems as if he has been around forever, stepping to some ether-level drumbeat. His story is too dramatic to be dreamed up by mere scriptwriters. Figuring that his career should easily run until he's 70, it's mind-boggling to think that he is only halfway there. What could be Next?

Jobs went into frenzied seclusion for several years after John Sculley shoved him out of Apple's door. But now that his sleek, sexy Next computer is shipping, he's suddenly out on the stump again. And for Jobs, it is clearly a stage of development he cherishes. For if ever there was a combination of showman and visionary stunning enough to make P. T. Barnum blush, it's Jobs.

He stopped by the recent Forrester Research, Inc. bash in

Continued on page 107

Perot set to prowl in business jungle

BY NELL MARGOLIS
CW STAFF

Free from an 18-month noncompetition agreement with General Motors Corp.'s Electronic Data Systems (EDS) division that severely circumscribed his latest company's activities in the systems integration market, EDS founder H. Ross Perot is about to come roaring back.

He is likely to find that it is a jungle out there, analysts said.

"We've gone from an idea to a 450-some-odd person company in two years," Perot said of Vienna, Va.-based Perot Systems, Inc., the firm he founded in 1987. He declined to detail the strategy with which his new company will take on his old, other than to say that its initial focus will be on commercial rather than govern-

Perot *likes "people who love to finish first"*

ment accounts. In addition, he emphasized the consistently high quality of his recruits as the core strength on which the firm will rely.

Echoing words he used to describe the building of EDS, the computer industry legend said, "I look for people who love to finish first, who cliff-walk with love for it, not fear of it. But I tell them: You will not be safe. You will not be secure. You will be walking into the jungle without a flashlight. If you can stand not living like that, then you don't have to join Perot Systems."

Perot's battle-tinged figures of speech are appropriate, analysts said. Doug Wilder, manager of systems integration at research firm Input, Inc.'s Vienna, Va., offices, said, "He's an amazing businessman, but at this stage of the game, Perot Systems doesn't have the full resources to compete with EDS. They don't have comparable finances, skills or buying power with the major computer vendors." However, he added, "that could change."

Uneven contest

"It's a mismatch," said Charles E. Taylor Jr., an analyst at Prudential Bache Research. He called the Perot vs. EDS question "that mountain-out-of-a-molehill issue. Perot is a tremendous entrepreneur. I expect him to have put together a pretty good company, with some pretty good people."

But can that be a competitor with EDS? "We're talking about a $5½-$6 billion company, with 45-50,000 people working for them," Taylor said. "If it weren't for the name 'Ross Perot,' we wouldn't be having this conversation."

In addition, analysts noted, Perot Systems is not taking on just EDS. Competitors such as IBM, Andersen Consulting and Computer Sciences, Inc. wield budgets in the billions.

Meanwhile, Perot Systems has several systems integration contracts, including a lucrative deal with McGraw-Hill, Inc. It also has a billionaire founder with a track record few dispute. "This could grow into another EDS. Why not?" Wilder said.

Gupta set to ride the Windows surf

BY CHARLES VON SIMSON
CW STAFF

MENLO PARK, Calif. — Its industry presence is still small, and the company's share of the database server market smaller still. However, executives at Gupta Technologies, Inc. believe that they will ride a market niche to a $100 million dollar payoff in three years, and that leaves them talking big — really big.

"Our surfboard is waxed up, and we just have to catch the Windows graphical wave," said Bruce Linn, product marketing director at Gupta. "Everyone else is still on the beach."

Gupta *wants his firm to be a market leader*

Founded in 1984 by Umang Gupta and D. Bruce Scott, both of whom left Oracle Corp. to start the company, Gupta Technologies develops and markets SQLbase, a relational database engine; SQLwindows, a Microsoft Corp. Windows-based graphical front-end development environment for relational database queries; and SQLnetwork, a DB2 gateway between Gupta front ends and the IBM database, as well as a number of multi-vendor connectivity products.

The private company claims $7 million to $10 million in 1989 revenue, with hopes to expand to nearly $20 million in 1990.

Money down

A lot of smart Silicon Valley investors are betting they will do it. Established venture capital firm Venrock Associates was a first-round investor, with much of the capital coming from the co-founders and the company's employees.

Some analysts dispute the company's size claims, however. A survey of several market research and Wall Street analysts puts Gupta at $3 million to $5 million for 1988 and an expected $5 million to $7 million for 1989. According to International Data

Continued on page 109

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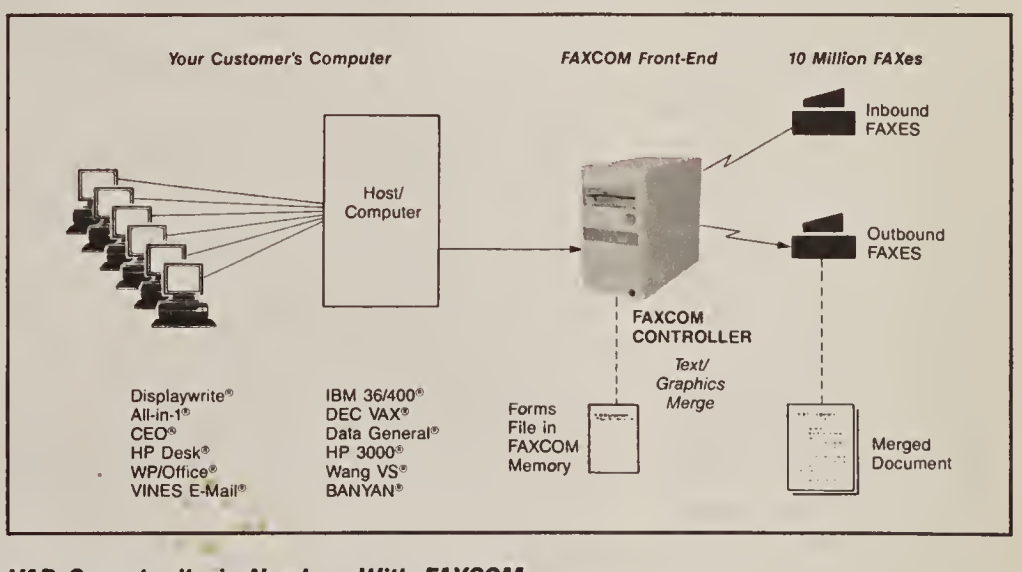

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Miniscribe bets the whole thing

BY NELL MARGOLIS
CW STAFF

LONGMONT, Colo. — In the face of woes ranging from aggrieved investors to impending investigations to an evaporating customer base, Miniscribe Corp. last week moved sharply to strengthen its toehold on solvency.

Miniscribe is basically betting the firm on its recently-debuted Series 7000 3½-in. disk drives. The reorganization announced last week — phase one of a several-stage restructuring plan, according to a firm spokesman — included a phaseout of all but three of the firm's offerings, including the Series 7000; relocation of manufacturing operations to Singapore; and the layoff of about 110 employees.

The restructuring will trigger an estimated $40 million charge against earnings in the second quarter of fiscal 1989 over and above previously announced charges, Miniscribe said. As a consequence, the company's negative net worth as of July 2, 1989, will increase to an estimated $130 million.

Miniscribe spokesmen last week made no attempt to minimize either the gravity of their company's situation or the draconian nature of its response.

"This narrowing of the product line will enable Miniscribe to reduce the company's fixed-cost base and improve operating efficiency," said President and Chief Operating Officer Kelly T. Hickel in a prepared statement. "We believe that the new Series 7000 . . . is the future of the firm."

Survival hopes

Shipping all manufacturing offshore, a spokesman said, was an unavoidable element of the critical need to conserve resources and target them at the product line on which the firm is pinning its hopes for survival.

It is a chancy strategy, according to analysts. But, they said, it just could work. "They have a shot," said one analyst, who requested anonymity so as not to become inadvertently embroiled in the barrage of legal problems from which Miniscribe is having difficulty extricating itself. In addition to an ongoing investigation into multiple incidents of alleged fraud disclosed in September, the company is currently attempting to fend off a series of shareholder suits that, if not settled, could end up driving Miniscribe into the protective arms of a Chapter 11 filing.

"About $100 million of their negative net worth is connected to convertible debentures," the analyst said. "If push comes to shove, they could ask bondholders to take equity in exchange for their rights." While Miniscribe stock is not a robust investment at the moment, he added, "as between zero dollars and stock, stock might look better." Such a swap, he said, would reduce Miniscribe's debt appreciably, leaving the company in a better position to ride its Series 7000 to recovery.

However, the analyst said, even if Miniscribe could negotiate its worth back to zero, the new disk drive line might not have the charge to power the company onto safe ground.

"They're trying to use technology as an edge, but they don't have a product that absolutely blows others away," he said. Moreover, he said, the company has an eroding customer base with increasingly scant reason to remain loyal to Miniscribe.

Ranged against Miniscribe and other vendors that have foundered, he said, are companies such as Conner Peripherals, Maxtor Corp. and Seagate Technology, all of which recently reported strong quarters.

On the other hand, he noted, "Miniscribe's situation is so bad that it might be good." With the company pushed to the brink, he said, creditors might refrain from pushing it over the edge, reasoning that their best chance to capitalize on their investments lies with the success of the Series 7000 line.

NetWare® 386 makes it easy

Netware 386 said to come close to minicomputer speed

BY PATRICIA KEEFE
CW STAFF

SAN FRANCISCO — "Netware for the '90s" debuts at the Palace of Fine Arts here today, where sources say Novell, Inc. will paint a robust picture of the long-awaited Netware 386. The 32-bit network software will run over both Intel Corp. 80386 and 486 systems, eventually offering up to 10 times the performance of its predecessor and support for up to 1,000 users.

"It's definitely a screamer," two sources said independently. The server capability announced is expected to take local-area networks up the ladder to compete in terms of capacity with minis and superminis.

Novell will detail a two-year release strategy for Netware 386 and outline plans for various product announcements throughout 1990, said sources briefed by the firm. Licensees of Portable Netware, a Unix port that requires Netware 386, are slated to attend along with providers of various 386 servers.

A single Netware 386 server will be demonstrated supporting 250 users located on four LANs, including two DOS, an Apple Computer, Inc. Appletalk and an OS/2 LAN, according to industry sources.

Netware 386 will be released in two stages: Netware 3.0 will ship in the third quarter along with a tool kit for Netware 3.1, which will ship in early 1990.

Sources said Netware 3.0 will include vastly improved performance, security and disk capacity; virtually "unlimited" numbers of files and volume size; use of the 386's virtual 86 mode to eliminate the 64 byte partition for applications; reduced system overhead; and more built-in services.

A modular approach will allow Novell to mimic 3Com's recently announced Open Protocol Architecture, which lets users drop in and out specific protocol stacks as needed, sources said. This will eliminate the need to dedicate a personal computer to each gateway.

Netware 3.1 will feature a communications server, the ability to support multiple protocol stacks and support for OS/2 LAN Manager's Named Pipes interprocess communication protocol on the server — the latter a significant reversal in strategy, said one analyst.

The long overdue and much-talked-about global naming facility, which is expected to resemble Banyan Systems, Inc.'s Streettalk, will ship as an upgrade to 3.1 at the end of 1990, a source said. Also on tap is an X.400 mail gateway that supports Novell's Message Handling System mail protocol.

Computerworld

Novell Brings 'Horsepower' To NetWare

BY TIMOTHY HAIGHT

SAN FRANCISCO — Novell Inc. last week unveiled NetWare 386—its fastest, most extensive, and ultimately, most open local area network operating system yet.

The Provo, Utah, LAN company also showed off new hardware and software developers' kits, and detailed its strategy to make NetWare an enterprise-wide network computing platform.

Users generally lauded the strategies and the new products, many of which had been expected (*CommunicationsWeek*, May 1). But several customers called for Novell to execute parts of the strategic plan more rapidly; some of the vendor's most important feature additions won't arrive until mid-1990.

"NetWare 386 is very significant, because it will allow Novell not only to add more users on a network but also to provide better management facilities and more horsepower for each job," said Bill Connett, director of computing for the University of Michi-

Network World

Communications Week

Novell wows users with NetWare 386

By Susan Breidenbach
West Coast Bureau Chief

SAN FRANCISCO — As expected, Novell, Inc. took the wraps off NetWare 386 here last week, promising 500 attendees of its 5th Annual Developers Conference that the first release will be out by early fall.

Designed for Intel Corp. 80386-based systems, the latest version of NetWare is a 32-bit network operating system that supports up to 4G bytes of addressable memory, 32 terabytes of

InfoWorld

Netware 386 Will Triple Power of Current Version

BY RACHEL PARKER AND MARK STEPHENS

Bringing new firepower to its network operating system war with Microsoft Corp., Novell Inc. will announce its next-generation Netware 386 product today at San Francisco's Palace of Fine Arts, according to sources briefed by the company.

Offering what Novell has said will be at least three times the performance of the company's current top-of-the-line Netware 2.15, Netware 386 is a complete rewrite of the Netware operating system and runs in protected mode on 80386-based file servers. The product is intended to blow the doors off its major competitor, Microsoft OS/2 LAN Manager, which runs in 80286 protected mode as a task under OS/2.

Novell is not expected to abandon its 286-based Netware 2.1X product line.

Novell president Ray Noorda told financial analysts and investors attending the Hambrecht & Quist conference last week in San Francisco that Netware 386 will ship within 90 days. Sources close to the company said an August or September ship date is likely.

Netware 386 is expected to be priced in the $7,000-to-$8,000 range, substantially high-

See Netware, Page 93

NetWare 386 Preview: Speedy New Release Was Worth the Wait

Editor's Note: Since early July, Novell Inc.'s NetWare 386 operating system has been beta tested at several sites across the country. Presented on this page and the facing page are the opinions and experiences of two beta testers, one at Martin Marietta Data Systems and the other at the University of California at Los Angeles. NetWare began shipping last week, according to Novell officials.

By Garry Frenkel

By now most people interested in LANs have heard and read a great deal about Novell's new NetWare 386. Longtime Novell users have eagerly awaited NetWare 386, and as a beta-test user I can easily say that it was worth the wait.

From the use of 1.2M-byte floppy disks (finally), to the scaled-down but still excellent documentation, to the simple installation (yes, it really does take less than 20 minutes), to the increased functionality, to the near-blinding speed, Novell has done a splendid job.

In our lab at Martin Marietta Data Systems, we have seen applications running on a NetWare 386 server show performance improvements of greater than 40 percent over a NetWare 286 server. This is impressive. The improvements in security are also welcome. Passwords are now encrypted at the workstation before being transmitted to the server.

For users running older versions of the workstation shell, the server can be set to allow unencrypted passwords.

In the past, our monitoring equipment was easily able to read the NetWare passwords as they were transmitted to the

PCWeek

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Rifkin

FROM PAGE 105

Cambridge, Mass., and strutted his stuff amid a lineup of speakers that could only be called star-studded. In two days, lucky attendees rubbed elbows with Ken Olsen, George Conrades, John Young, Ed Esber, Enzo Torresi, Bill Gates — and Jobs. The only MIA was John Sculley, who canceled out at the last minute.

Speaking to a room filled with seasoned IS pros and assorted vendors, Jobs was entering unknown and potentially hostile territory. These folks were grappling with the desktop dilemma of DOS vs. OS/2. The last thing they needed was yet another desktop device running some newfangled version of Unix called Mach.

Still, Jobs managed to steal the entire show in about five minutes. He stood up in his dashing Italian suit — a far cry from his jeans-clad Apple days — and flashed his million-dollar smile. You could feel the crowd melt into his hands; after all, the other guys may be industry heavyweights, but this was a real live *celebrity*.

No one knew what to expect. Would he be arrogant? Would he screw up?

"I could run through a few slides here, or we could just talk. What do you think?" he asked the audience in his most charming, disarming manner.

He then ran through a cleverly produced slide show which came to the only obvious conclusion: PCs are user-friendly but have hit the power ceiling. Workstations have plenty of power but are not user-friendly. So what new, sleek, black machine fits snugly into the perfect power and ease-of-use corner? You got it.

Even the skeptics moved forward in their seats when Jobs sat down and demo'd Next. Like Horowitz at the keyboard, he showed the dazzling capabilities of multimedia electronic mail, futuristic file sharing and windowing and five-minute application development. He played the Canon company song through the system. "In Japan, it makes them weep," he said.

Jobs even admitted a major mistake: targeting only the education market for Next. He credited Businessland for opening his eyes by making him a dealer package offer that he couldn't refuse.

And the man who used to openly scorn IBM talked about alliances with Big Blue and the soon-to-be-unveiled connections to myriad environments, including IBM. Next will soon hook into IBM's Professional Office System, for crying out loud.

When Jobs bounded offstage to thunderous applause, there was a feeling that he could have sold a few computers right there in the hallway. Even the most hard-bitten were moved, at least a little.

Of course, a reality check came in the form of Bill Gates, the Microsoft maestro, who makes no bones about his disdain for Next. Gates glanced with scorn at the Next machine sitting nearby on stage and told the audience that there are 75 small companies working on similar packages; the main difference is that they don't get the attention Jobs receives.

"Tying a development tool to one piece of hardware is crazy," Gates argued. "I give him credit, but hey, if you want black, I'll sell you a can of paint."

Gates made it clear that he had no intention of writing for Next. "We're in the business of writing for machines that sell in the millions, so this is not for us," he said.

Jobs had ducked out after his talk, so there was to be no wrestling match with Gates. Too bad. Here the audience had arguably the two most influential figures in the history of personal computing in the same room and missed a great debate opportunity.

One thing was clear: Gates may have every logical business argument on his side, but Steve Jobs has spent the past dozen years kicking logic in the chops. He may be way off base this time, but he's a bad guy to kiss off lightly.

Rifkin is a *Computerworld* features editor.

to believe what you read.

Novell Is Shipping Netware 386 3.0 Earlier Than Expected

BY DAVID J. BUERGER

PROVO, UT — To the surprise of beta testers and industry insiders, Novell Inc. shipped last week its first copy of Netware 386, Version 3.0 earlier than expected.

Early users will be limited to file and print service, however, with server-based applications and multiple protocol support not scheduled to appear until 1990. Netware 386, price ... significant increases i... services over Netware ... previous top-end pro...

"We've had very few problems with server crashes," said David Hoisbe, network project director at the University of Utah. "Overall performance is impressive."

Hoisbe said ad hoc tests showed Netware 386 performing roughly 15 to 25 percent faster than the 286 version.

Beta testers liked the easier installatio... the capability for one volun... 32 physical drives.

...sent from this release is ... won't give Banyan Systems Inc.'s ... Workbench, based on ...

Watcom 386 C compiler and required to develop Netware 386-specific applications, called Netware Loadable Modules. [Netware 386] is ready ...munity quite ...

Because development tools are missing, testers agree that Netware 386's primary current value is for file and print sharing.

Users will have to wait for Version 3.1 for other Netware 386 features like ...multiple transport protocols ...unications like ...es. Version 3.0 ...X protocol. ...interested in is ...tocols, especially ...

InfoWorld

NetWare 386 gets high praise

BY JOEL SHORE
Provo, Utah

Novell Inc., riding a wave of rave reviews from beta testers, ... last Tuesday began shipping NetWare 386, keeping its word that the "networking platform for the 1990s" would r... before the end of Sep...

The first customer t... a production vers... NetWare 386 VINI... was Coca-Cola Foods o... ton, one of 24 sites tha... tested the product.

"Corporate America ha... growing its LANs faste... pushing them further that... body could have imagined," ... Cheryl Currid, director of ... plied Information Techno... at Coca-Cola Foods.

NOVELL CHANGES RULES

"As a result, LANs were b... ing asked to do things that the... weren't designed or optimized ... to do. From my perspective, ... wall was about to be hit. Now, ... as a result of the efforts that ... went into NetWare 386, the ... rules and the limitations of the ... network game have just ... changed. Novell has pushed ... the wall back," said Currid.

As part of its development ... program, the product under... went vigorous beta testing at 24 ... sites, including United Parcel ... Service, Martin Marietta Corp., ... Southern California Edison and ... Oregon State University.

"Comments from our [beta]

Computer Reseller News

NetWare 386 May Pack Punch To Knock Out the Competition

By Bob Enyart

Novell Inc.'s NetWare 386 ... functionality and flexibility, ... based on a beta version exam... ined by PC Week at Novell's Pro... vo, Utah, headquarters. ... For those with the fin... wherewithal to spri... system—initia...

For Other NetWare 386 News, Turn to Pages 8, 10 and 35.

PCWeek

NetWare 386: The network server platform for the '90s

BY JODI MARDESICH

SAN FRANCISCO—The waiting and speculation are over. Novell has unveiled NetWare 386 v3.0 and v3.1, the company's "server platform for the '90s."

"NetWare 386 is a major redesign of the NetWare operating system that takes advantage of 386 architecture," said Richard King, vice president of software engineering for Novell's NetWare Products Division. "It is a 32-bit operating system, so it fully exploits the capabilities of the 386 [chip] and improves performance.

"Our benchmarks show NetWare 386 is 200-300% faster than the 286-based versions of NetWare."

NetWare 386 supports up to 250 nodes per server, up to 32GB volumes, with 32 physical drives per volume for a total of 1,024 physical drives per server; 100,000 concurrent open files; more than 2 million directory entries per volume; a maximum file size of 4GB (files can span physical drives); a maximum volume size of 32 terabytes (1,000GB); and up to 4GB of memory in the server.

NetWare 386 will ship third quarter 1989.

LOADABLE MODULES

"NetWare 386 is not just another file server," King said. "It's designed as a network server operating system."

King said the operating system has been architected in a modular way, so that users can incrementally add functions to the server platform using server-based applications called NetWare Loadable Modules (NLMs).

NetWare printing services, the LAN drivers, disk drivers, Btrieve, and some NetWare utilities, including installation, are being implemented as NLMs.

"By loading an NLM, you actually extend the operating system," King said.

"The key to NetWare 386 is its

continued on page 9

LAN TIMES

NOVELL

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NICKELS & DIMES

Computer Network Technology Corp. reported revenue of $3.2 million and a profit of $504,757 for the third quarter ended Sept. 30. This compares with revenue of $1.3 million and a loss of $405,527 for the same period in 1988.

Masstor Systems Corp. announced revenue for the quarter ended Sept. 30 of $16.3 million, up 68% from the like quarter a year ago. Net income for the quarter was $839,000, compared with a net loss a year ago of approximately $3 million.

Cognos, Inc. announced revenue of $29.1 million for the quarter ended Aug. 31, 1989, which represented an increase of 19% over the previous year's second-quarter revenue of $24.4 million. A net loss of $6.2 million compared with a $1.4 million profit for last year's like period.

Southwestern Bell Corp. reported that net income for its fiscal third quarter was $295.3 million, compared with $323.3 million for the third quarter of 1988. Revenue for the three months ended Sept. 30 was $2.21 billion, down slightly from $2.23 billion last year.

BMC Software, Inc. reported that revenue for the second fiscal quarter ended Sept. 30, 1989, was $21 million, up 46% from $14.4 million for the same period in fiscal 1988. Net income increased 52% to $4.1 million, compared with $2.95 million for the same quarter last year.

Concurrent Computer Corp. reported a first-quarter net loss of $1.6 million, compared with a net loss of $400,000 in fiscal 1988 first quarter. Net sales for the quarter were $87 million, compared with $18.7 million in the prior year.

Infotron Systems Corp. announced revenue for the third quarter ended Sept. 30 of $24.1 million, matching third-quarter 1988 revenue. Third-quarter 1989 earnings were $673,000, compared with $1 million in the same period of 1988.

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Foreign Buyer Program

IN BRIEF

By the time I get to Phoenix

Two weeks before the holidays, Norwood, Mass.-based **Phoenix Technologies Ltd.** bagged the top item on its wish list: the leader it has been seeking since late summer. Computer industry veteran executive **Ron Fisher**, most recently president and chief executive officer of Eastman Kodak Co. software subsidiary Interactive Systems Corp., will take on those same two titles at Phoenix sometime before the first of the year.

Interim chief **Ted Joseph** will remain a Phoenix director as well as the founder-to-be of his own workstation systems integration firm.

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What a CAD

IBM's inconspicuous November purchase of **Cadam, Inc.**, its computer-aided design (CAD) software supplier's subsidiary, was largely a defensive move, according to a recent research report. Had Cadam been acquired by a competitor — say, **Fujitsu America, Inc.** or **Intergraph Corp.** — IBM would have stood to lose its CAD market leadership position, according to the International Data Corp. (IDC) report. Being king of the CADs is a matter of cash as well as cachet: According to the IDC study, that market accounted for $1.6 billion in 1988 revenue for IBM.

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White collars, pink slips

According to Dan Lacey, a consultant whose firm tracks worldwide employment trends, mass cuts of white-collar jobs at U.S. firms have reached epidemic proportions this fall. Computer firms, Lacey said, lead the trend, with automotive, telecommunications and financial services also looming large.

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Goal scores

Columbus, Ohio-based software vendor **Goal Systems International, Inc.** last week announced its impending acquisition of **MVS Software, Inc.** in a pooling of interests valued at approximately $27.5 million. The MVS buy follows on the heels of Goal's $20 million stock-swap purchase of **Essential Software**, announced one week earlier; taken together, said President William Wetmore, the moves afford Goal a quantum leap forward in the automated data center arena.

. . . . . .

Sad salute

The competitive computer-aided software engineering market (CASE) claimed a CASE pioneer's firm early this month: **Optima Development, Inc.**, founded by noted methodologist Ken Orr.

Gupta

CONTINUED FROM PAGE 105

Corp. (IDC) statistics, SQLbase holds about 3% of the SQL database server market (seventh overall in the $69 million market).

"Today, we are probably behind companies like Ashton-Tate 30-to-1 in total installed base," said Chuck Ellison, who recently joined Gupta Technologies as vice-president of marketing after holding the same job with Ashton-Tate Corp. His arrival, he said, signaled his belief that the gap is about to narrow.

If it does, it will likely be on the strength of Gupta's front-end and development tools. "They have the strongest technology and are the most PC-oriented company in the database area," said Bahar Gidwani, an analyst at Kidder, Peabody & Co. "There is no one in the industry better positioned for growth than Gupta."

Customers implementing systems on local-area networks seem to agree with that assessment. "We are running trading systems fom a PC network environment, and Gupta was the clear leader in performance," said James Krema, information systems manager at Chicago-based Dreihaus Securities.

Rough road ahead

Although well positioned, Gupta faces several rough transitions in the next year. To bolster its already strong stance in the Windows market, the company promises a retail, end-user-oriented version of its SQL front end working from the still-unannounced, but widely demonstrated Microsoft Windows Version 3.0 in the second half of 1990.

The success of that product could be critical to Gupta's success as a company. According to Umang Gupta, SQL Windows accounts for 20% of the company's total revenue today and will account for 50% within three years — the same time frame in which Gupta said the company plans to reach the $100 million mark and go public.

The retail product, to be shipped in the second half of 1990 and internally codenamed Quest, is a powerful and flexible mix of relational database technology, business graphics and the compelling Version 3.0 of Windows. It is that kind of presence that Ellison and Gupta feel will be critical to mass-market success. A recent demonstration for *Computerworld* showed tight integration with Version 3.0 of Windows and an implementation of the interface that allows even a novice user to manipulate very sophisticated data queries.

The strategy entails some very basic risks. While the company has a strong and stable niche in DOS front ends, the horizon for OS/2 is not nearly so clear. Gupta faces heated competition from all of the major database vendors and will not ship a Presentation Manager version of SQL Windows until sometime in 1990.

"It is a strategy that will work if corporations do a two-stage migration from character to Windows to OS/2," said Nancy McSharry, a personal computer software analyst at IDC. "That is certainly a possible scenario, but if MIS goes right to OS/2, Gupta may well get left behind."

"We are looking at 40% growth in CASE and related markets such as those for Gupta's tools and front ends," Gidwani said. "I think $100 million in three years may be overly optimistic, but they could certainly make $50 million, and that's not bad. The strategy of capturing the minds of developers and then going into retail channels certainly worked for Ashton-Tate and their Dbase product."

In addition to the uncertainty over DOS and OS/2, the company moved away from its primary momentum in the database server market when it ended an agreement to provide the database engine for Lotus Development Corp.'s application front ends. When the agreement was severed a year ago, it accounted for nearly half of Gupta Technologies' total revenue and had ensured the company's profitability in the early years of its existence. It was a necessary move to position the company for long-term growth, but President and founder Gupta considers it to have been one of the company's greatest risks.

"We did not want to simply be selling engines to other vendors," Gupta said of the decision. "Had we stayed with Lotus, we would not have had complete control over our own technology."

Not a one-trick pony

Although the company may sink or swim based on its performance in the Windows market, Gupta is not a one-product company. It has solidified its sales into large corporate accounts with a solid gateway product allowing connection to mainframe-resident IBM DB2 databases that use an advance in result-set software technology to allow users connected to a remote host to scroll forward and backward through selected data, rather than just forward, which is all DB2 will allow. This small advance is a significant strength.

After shipping for about a year , the company counts a number of Fortune 500 firms, including Drexel Burnham Lambert, Inc. and K Mart Corp., among its gateway customers.

Even with that strength, Gupta acknowledges that the transitions his company needs to make will not be easily accomplished.

"We are trying to [develop] from a technical leader into a market leader," Gupta said. "Managing that kind of change is one of the most difficult tricks in this business."

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3M

Joining an outsourcing team

IS service organizations can create opportunities but make demands too

BY SHERYL KAY
SPECIAL TO CW

In the late 1960s and early 1970s, a manager's career at a successful data processing service bureau may have seemed limitless as these companies grew rapidly.

However, with the evolution of technology, corporations shifted their resources to in-house information systems organizations, and careers at service bureaus became less alluring. Today, a renewed interest in service providers stemming in part from a nationwide corporate preoccupation with economy measures may again draw attention to career prospects at companies that sell information systems services.

Fresh interest in external suppliers of IS services is fueled by moves from a growing number of companies to outsource services ranging from information processing to personal computer support. In October, Eastman Kodak Co. turned over its data center operations to IBM in the most visible of recent outsourcing deals. Earlier this year, Meritor Financial Group outsourced data and check processing to Electronic Data Systems Corp. (EDS). In both cases, employees of the client were transferred to the service provider, thrusting these individuals into the IS service industry.

Input, Inc., a market research and consulting firm in Vienna, Va., predicts the systems operations market will grow 17% a year, from $5.9 billion in 1989 to $12.8 billion in 1994, as more companies outsource IS services. That market includes some professional services as well as processing services, with the latter expected to show the greatest growth. "You can outsource people, or you can outsource the people and the equipment. The market continues to blur," says Doug Wilder, manager of Input's systems integration program.

One attraction of the IS services industry for corporate IS managers is the opportunity to work in an employer's chief line of work rather than a support function. Because IS is everyone's concern, it is easier to gain management's recognition for achievements and win greater resources, says Pete Gross, vice-president of advanced technology at Computer Sciences Corp. in Falls Church, Va. "From top to bottom, our focus is consistent," Gross says.

In a corporate IS organization, "promotions are slower, growth is slower and competition for the fewer number of executive positions becomes more intense," says Tim Connor, president of ACS Financial Services in Dallas.

As an added benefit, employees of IS service companies are more likely to work with the latest techniques and technologies, says Laurence Liss, a senior vice-president at Meritor Financial who is responsible for managing the company's relationship with EDS.

There is also more "organizational cross-pollination" at service providers, which gives IS people there greater opportunity to move into nontechnical areas such as marketing or finance. "We have people from operations who are now working in sales," says Camille Gillespie, a senior market analyst at EDS. "One of a manager's responsibilities is to talk about your career path and how to make it happen."

One individual who has made such a transition is Ed Deenihan, who now serves as marketing manager for discrete manufacturing industries at EDS in Dallas. Deenihan pursued a traditional IS career, starting as a programmer at the company that now owns EDS, General Motors Corp., then moving on to systems analysis and technical management. "Because the focus at EDS is information systems, a person like myself is provided with greater opportunity and diversity of job assignments than at a manufacturing company," Deenihan says. Systems executives in IS organizations are still categorized narrowly, limiting their careers, he says.

> ONE ATTRACTION of the IS services industry for corporate IS managers is the opportunity to work in an employer's chief line of work rather than a support function.

Another potential benefit of working in IS services is that an executive can broaden his knowledge by dealing with a variety of clients spanning a number of industries, says Skip Tolette, a partner at executive recruiting firm Schmitt Bishop Tolette in New York.

However, relocation is sometimes the price for such opportunities. "For some of the younger and more capable technicians who are more mobile, [the move to EDS] is a tremendous opportunity," Liss says. "If you're the kind of person who is not interested in relocating, you close yourself off from some opportunities at a company like that."

Managers point to other potential drawbacks to working in IS services. With its prospects for growth, work weeks can run to 80 hours, Connor says.

"There's no question they're demanding," Liss says of EDS. "If you're a person who just wants to get by, you're not going to do well."

Positions at firms that sell IS services can call for skills not always emphasized in corporate IS groups. The ability to nurture trust on the part of prospective clients is an important one for senior managers. "There is a comfort level that has to be a part of any engagement," Gross says. Each member of the service company's executive team therefore becomes a diplomat and a negotiator, he says.

Salaries in the IS services industry average about $40,000 a year, Gillespie says. The pay can be less than it is at IS groups in fields such as banking and securities, Tolette says. However, executives should remember the trade-offs, he says. "Your opportunity for career growth may be faster because of your exposure to different industries at the services company."

Kay is a Tampa, Fla.-based business consultant and free-lance writer specializing in emerging technologies and human resources.

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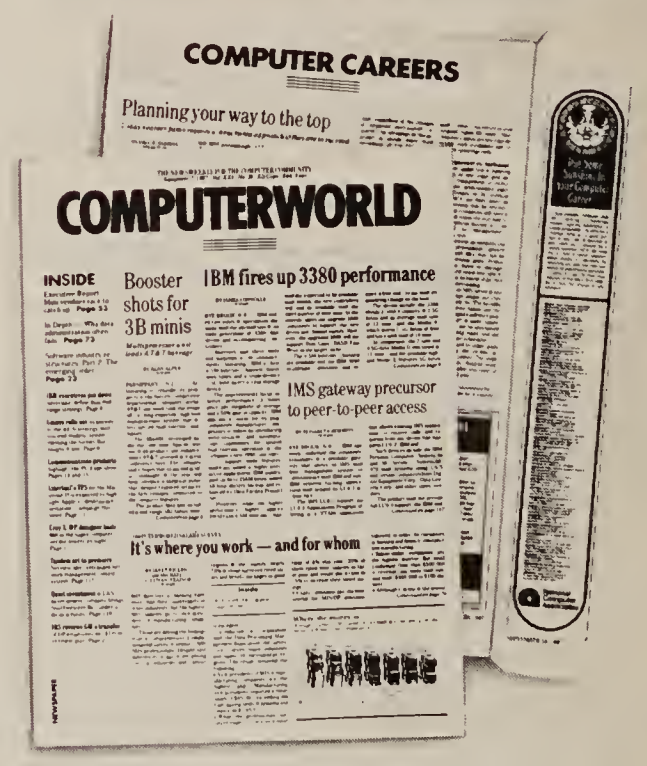

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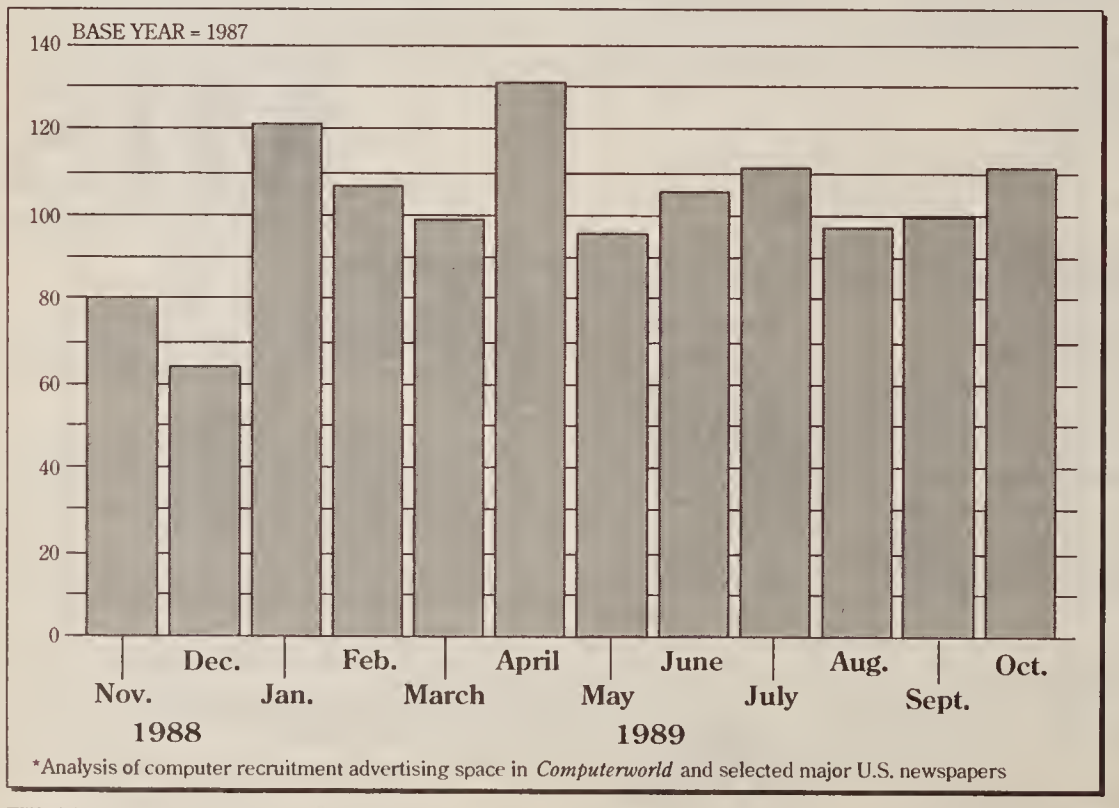

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COMPUTER CENTER ASSISTANT DIRECTOR - Bachelor's degree in Computer Science or Information Systems required. Master's degree preferred. DEC VMS operating systems internal experience is strongly preferred. Preference may also be given to applicants with COBOL systems design and management skills. Nestled in the foothills of the Smoky Mountains, Cleveland is located in the Tennessee Valley, population approximately 60,000. College headcount is 3,000 students. Water sports, hiking, camping, backpacking available in vicinity and nearby mountainous national forest and wilderness area. Skiing available in mountains approximately two hours away.

Review of applications will begin immediatley, applications will be accepted until the position is filled. Cleveland State Community College application forms and position announcements are available from: Personnel Office, Cleveland State Community College, P.O. Box 3570, Cleveland, Tennessee 37320-3570 or call (615) 472-7141. AA/EOE M/F/H

PROGRAMMER/ANALYST -Partake in analysis, design and development of automated and accounting software in a Honeywell Mainframe DPS/8 environment. Require Bachelor's in Computer Science or Math and 2 years experience including Honeywell Mainframe, GCOS8, DMIV/TP, Jackson Structured methodology or SDM. Salary: $35,000 per annum. Job Location: Nashville, TN Resume to: Kathy Malo, Job Service Prog & Technical Support, Tennessee Department of Employment Security, Nashville, TN 37245-1200.

TPF SOFTWARE ENGINEER required. Analyze complex technical problems for solution by computer, formulate solution criteria for subordinates, design ACP/TPF systems and programs, monitor the development and implementation. Act as team leader. Insure that programming team uses standardized techniques to perform and document each assigned task in accordance with completion schedules. Verify the logic of all work by preparing and using test data in trial runs. Instruct appropriate user personnel on new system designs to be sure that all user requirements have been met. All work to be performed in an ACP/TPF environment.
Applicants required to have bachelors degree in Math, Computers or Engineering with at least two years ACP/TPF programming and software analysis. Education and experience will be acceptable if applicant possesses a combination of education, professional development training, and experience found to be equivalent to a bachelors degree in Computers plus two years experience with ACP/TPF programming and software analysis.
Annual salary will be $36,000 per year for a 40 hour work week. An additional salary will be paid up to $44,000 for additional experience and education.
Resumes to:
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421 East Dunklin Street
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Reference J.O. #307132

PRODUCT DESIGN ENGINEER. Project Engineer for design and development of microprocessor based systems using 8/16/32 bit architectures (Intel 80286, 80386), peripheral chip sets, disks, DMA, memories and graphics. Required to plan projects from definitions, research value and cost effectiveness, and testing from development through technical support for finished product. Will also be responsible for development of real time operating systems and user interface software in Assembly and C under MSDOS. Design with high speed electroluminescent and other graphic flat displays along with implementation of pattern recognition and imaging principles. Assure compliance of products with UL, NEMA and other industry standards. 40 hrs/wk. M.S. in Electrical Engineering. 1 yr. exp. in job offered or 1 yr. related exp. as research engineer with experience using 8/16 bit microprocessor based system design. $30,000/yr. Apply at the Texas Employment Commission, Houston, Texas or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. Job Order #5518050. Ad paid by an Equal Employment Opportunity Employer.

SR. ACP/TPF SOFTWARE ENGINEER required. Design and implement ACP/TPF Direct Connect System. Use technical knowledge of Real Time Step by Step Trace with Structured Programming Macros and ACPDB (Database manager) to maintain competitive technological advantage. Act as team leader for group of 8-10 less senior analysts as required. Maintain integrity of databases and applications software by programming in Basic Assembler, using CMS development tools in ACP/TPF environment with application of ACPDB principles. Applicant must possess a bachelors degree in Computers, Math or Engineering and one year ACPDB experience. A combination of training, education and experience will be found acceptable if equivalent to a bachelors degree in a computer intensive area and a minimum of 4 years ACP/TPF Software Design and Basic Assembler Coding experience (including 1 year of ACPDB). Annual salary will be $47,000 per year for a 40 hour work week. Additional salary up to $52,000 may be paid if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Dallas, TX, or send resume to the Texas Employment Commission, Austin, TX 78778-0001, J.O. number 5757188. Paid by an Equal Opportunity Employer.

Consultant/Systems Analyst; 40 hrs/wk; 8:30am-5pm; $33,000/yr.; overtime as needed, not compensated. Job requires Master's degree in Management Information Systems OR Computer Based Information Systems. Job also reqs.: 1) one grad course in systems analysis; 2) 1 grad crse in Data Base Management Systems; 3) 1 grad crse in Software Engineering; and 4) 1 grad crse in Administrative Controls OR Management Accounting. Job duties: Design and develop computer software for a variety of business and educational information systems. Manage and direct programmers assigned to specific project. Evaluate specific customer's needs. Recommend optimal computer hardware and software to satisfy customer requirements. Application development tools SYNERGIST and dBase, and computer languages COBOL and Pascal will be used to complete job duties. Qualified applicants should send resume and verification of reqs. to 7310 Woodward, Rm 415, Detroit, MI 48202. Ref #82889. Employer Paid Ad.

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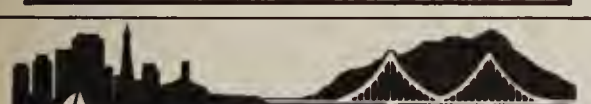

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Statistics on the reliability of more than 700 IBM and IBM-compatible mainframe computer systems indicate that the likelihood of a system failing increases with the number of processors in a machine.

The growing likelihood of failure as the number of processors increases is to be expected given the greater complexity of multiprocessor systems, according to Larry Martin, vice-president of Norwalk, Conn.-based Reliability Research, Inc., which compiles and distributes monthly data on failure rates of computer hardware.

"The more hardware you have, the higher the probability that any one piece will fail," Martin says. "If you assume the probability of any one piece failing is consistent, then as you add more and more hardware to a particular system, you're going to find the system itself will fail more often."

Martin says there is little difference in the performances of IBM machines and plug-compatible mainframes with four processors. In the case of the two-processor models, however, the Amdahl and particularly the Hitachi systems look more reliable, he says.

"Basically, the Hitachi numbers are twice IBM's," Martin says. However, the figures for some of the Hitachi systems are based on small samples.

The failures include incidents involving the systems' central processors, main memory and channels. They are defined as events that, according to the system's vendor, call for immediate response from the support organization. The numbers are based on performance during a six-month period that ended in September. During that time, the systems generally ran continuously or nearly continuously.

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Model	Number of processors	Average number of months until failure
IBM 3090		
• 100	1	27.6
• 200	2	13.4
• 300	3	9.6
• 400	4	9.1
• 500	5	7.8
• 600	6	5.4
Hitachi		
• XL60	1	37.2
• XL80	2	26.1
• XL90	3	23
• XL100	4	8.5
Amdahl		
• 5893	2	16.2
• 5896	4	7.1

SOURCE: RELIABILITY RESEARCH

CW CHART: JOHN YORK

Index

Marketplace 120
Buy/Sell/Lease 120
Software 123
Peripherals/Supplies 123
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The BoCoEx index on used computers

Closing prices report for the week ending December 1, 1989

	Closing price	Recent high	Recent low
IBM PC Model 176	$500	$600	$400
XT Model 086	$750	$950	$700
XT Model 089	$750	$1,400	$800
AT Model 099	$1,350	$1,600	$1,300
AT Model 239	$1,825	$2,000	$1,700
AT Model 339	$1,825	$2,000	$1,700
PS/2 Model 50	$1,525	$1,900	$1,500
PS/2 Model 60	$2,700	$3,100	$2,500
Compaq Portable I	$645	$750	$550
Portable II	$1,625	$1,725	$1,550
Portable III	$2,350	$2,875	$2,100
Portable 286	$1,800	$2,000	$1,600
Plus	$750	$950	$675
Deskpro 286	$1,675	$1,975	$1,600
Deskpro 386	$2,500	$2,900	$2,500
Apple Macintosh 512	$675	$900	$550
512E	$750	$925	$550
Plus	$950	$1,050	$900
II	$3,750	$4,000	$3,300
Toshiba T-1600	$3,025	$3,200	$2,750
Zenith 183	$1,000	$1,375	$975

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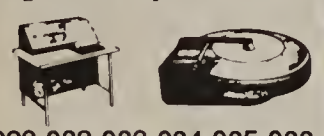

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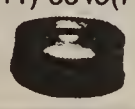

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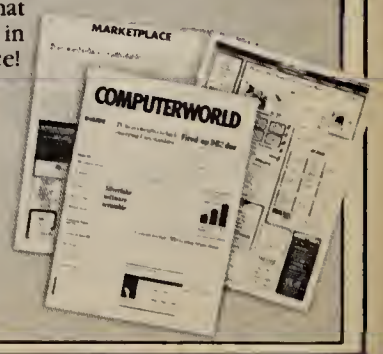

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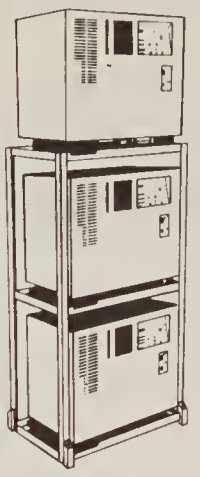

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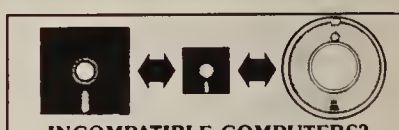

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Eugene School District 4J solicits information for business systems to serve the Eugene School District which includes one or more of the functional areas of payroll, budget, and human resources. The proposed system must be VAX/VMS compatible. To be considered a proposed system must be demonstrable and be fully implemented in a comparably sized organization. For a copy of the RFI/RFP contact Dr. Dale Reed, Purchasing and Central Services Manager, 200 North Monroe, Eugene, OR., 97402, phone (503)687-3461. Please refer technical inquires to Terry Hippenhammer, Director of Computer and Information Services, (503)687-3329. RFI's are due on or before 2:00 p.m., January 17, 1990.

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Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1686, due Thursday, January 4, 1990 at 3:30 p.m. for the acquisition of 11 80286 laptop portables, 1 80386 desktop microcomputer and related software and peripherals for the DEPARTMENT OF HUMAN SERVICES.

Request for Proposal No. 1669, due Wednesday, January 3, 1990 at 3:30 p.m. for the acquisition of a network server and two (2) workstations for JACKSON STATE UNIVERSITY.

Request for Proposal No. 1690, due Thursday, December 28, 1989 at 3:30 p.m. for a maintenance contract for 12 Leading Edge computers and 2 modems for WHITFIELD STATE HOSPITAL.

Request for Proposal No. 1691, due Thursday, December 28, 1989 at 3:30 p.m. for the acquisition of 22 Unix-based workstations to compliment an existing network server system at MISSISSIPPI STATE UNIVERSITY.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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It looks good, but will it work?

A thorough assessment of training material calls for careful delegating

BY EDWARD W. SCHNEIDER
SPECIAL TO CW

It looked like a good idea: an off-the-shelf training package for the database program your company is bringing in. You ordered a review copy, and now you have 60 days to decide whether it is for you.

As you unpack it, you start creating a mental list of the features that should be checked:

- Is the content correct and up-to-date?
- Does the package cover all the topics your students need?
- Does it begin at the right level?
- Will it take them far enough?
- Is there a good balance between explanations, examples and practice?
- Is the pacing right?
- Are the materials interesting and easy to read?
- Are there quizzes to verify students' progress?
- Is the package easy to set up and administer?

With a sinking feeling, you realize that the list is longer than you expected. Some of the questions require detailed knowledge of the students' skills and job requirements. Whom should you ask to help you? There are a number of possibilities, although each of the various individuals can address only some of your concerns. Here is a list of those people, complete with expectations regarding their responses.

Database guru: This is the lady who recommended the database program. She will find that the training package barely mentions a number of advanced features and a few applications are not illustrated in the examples. She will also point out that the materials are too basic.

Training developer: The videotapes will draw his attention first. The image quality is all right, but the characters are not very believable, and they spend most of their time being enthusiastic instead of showing how to use the program. The printed materials look nice too, but they are not formatted the same way as the courses the training department developed, so the trainers will have trouble using them.

He will also raise the issue of recurring costs; you will have to order bushels of manuals and several copies of the videotapes to get enough to go around. When you add it all up, you may not be that far away from the cost of a short custom-developed course.

Trainer: She comments favorably on the simplified layout of the instructor manual. She likes the package as far as it goes, but some of the units are a bit superficial; they show how to do certain operations without explaining why a user would want to do them.

Personal computer software support specialist: He likes the course but is pessimistic about its ultimate value. In his experience, employees are unwilling to spend time learning general concepts; they want to start right in on their own applications.

A department manager: She is glad to see that training is being provided with the new database program. However, she is concerned that it may take a long time for her department to recoup start-up costs as her people spend time learning to use the new tool.

A user who has learned the program through the documentation: He wishes that the training materials referenced the documentation.

Some of the input from these people is useful, but taken together, it only touches on a few of the items on your checklist. A better approach would be to ask specific questions, such as the following:

Ask the PC software support specialist to compare the examples and sample applications with the applications users bring to him.

Ask the user who has just learned the program to review the three topics that he found most elusive.

Ask the department manager to rank the list of applications that the PC support specialist produced by their importance and indicate whether any important applications are missing.

Ask the trainer what content should be added or removed to match the background and learning styles of students and priorities of the manager.

Ask the database guru if the list from the trainer is up-to-date and the explanations are technically correct. Also ask whether the training materials duplicate or complement the documentation and what else newcomers will need to know.

Ask the training developer if the units on the guru's and trainer's list have adequate examples, practice and feedback for student answers.

Also ask whether tests require application of skills that have been learned, or just ask the student to recall isolated facts. If there are deficiencies and topics to be added, how much would it cost to develop the supplementary materials?

Finally, ask yourself whether, in light of these comments, everybody should go through the entire course. Are there a few basic units that can be followed by optional advanced applications as needed?

Treat the training package as you would an off-the-rack suit; to fit you properly, it is going to have to be taken in a bit here and let out there. If too many alterations are required, you don't buy it — you go back to the rack to look for a different size.

Schneider is proprietor of Peacham Pedagogics in Madison, N.J.

EXPERT SYSTEM TRAINING

The expert system technology is one that is fraught with new terminology, techniques, and methodologies. In order to become proficient in developing expert systems, one must glean a lot of information from books and courses.

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COMPUTERWORLD's

December/January

Training Editorial Topics

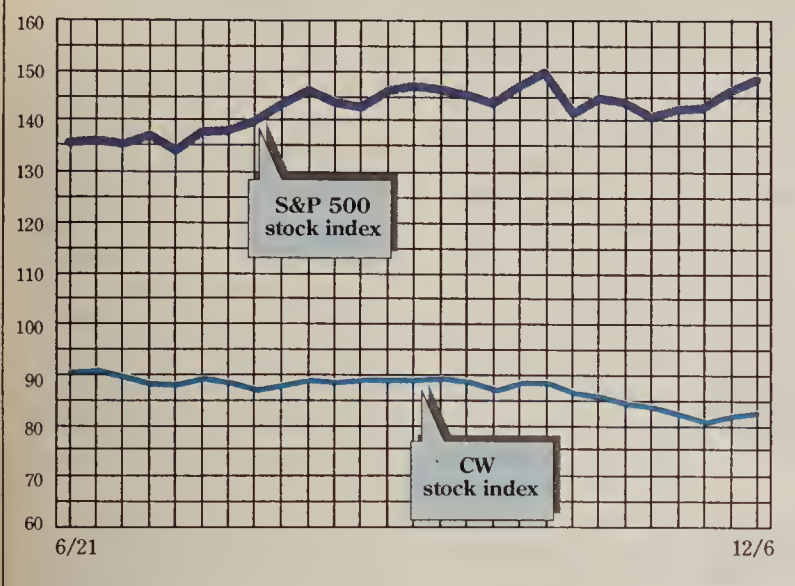
18 **Training Front-line Personnel for Decision-making**
Section Feature (Management):
Continuing Education for CIOs
Ad Close: Dec.12

1 **Forecasting your training needs**
Annual Forecast Issue
(December 25, 1989/January 1, 1990 Combo Issue)
Ad Close: Dec. 20

8 **Characteristics of the perfect trainer**
Executive Report:
The dollars and sense of outsourcing
Ad Close: Jan. 2

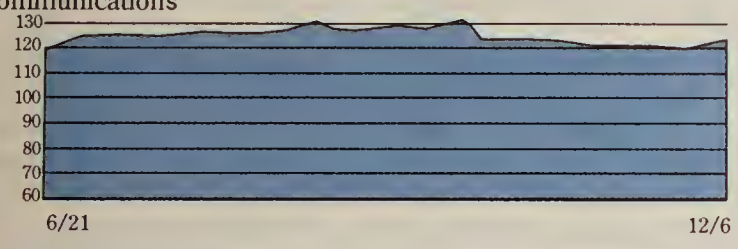
15 **What users should know about training**
Executive Report:
What IS brings to the food industry
Ad Close: Jan. 9

STOCK TRADING INDEX

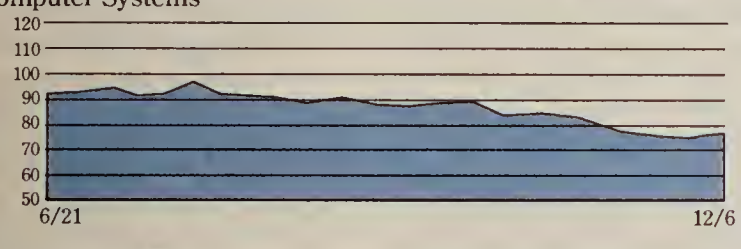


Indexes	*Last Week*	*This Week*
Communications	122.8	**124.4**
Computer Systems	75.7	**76.5**
Software & DP Services	116.0	**118.0**
Semiconductors	50.9	**50.8**
Peripherals & Subsystems	71.8	**71.1**
Leasing Companies	101.7	**101.0**
Composite Index	82.6	**82.9**
S&P 500 Index	145.8	**147.4**

Communications



Computer Systems



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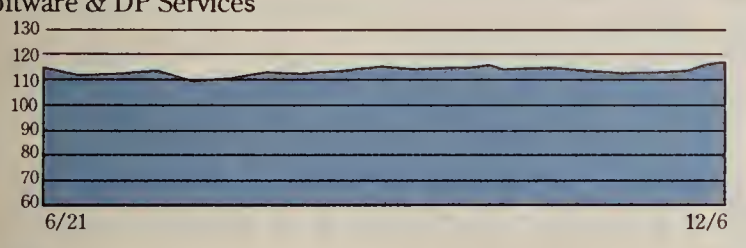
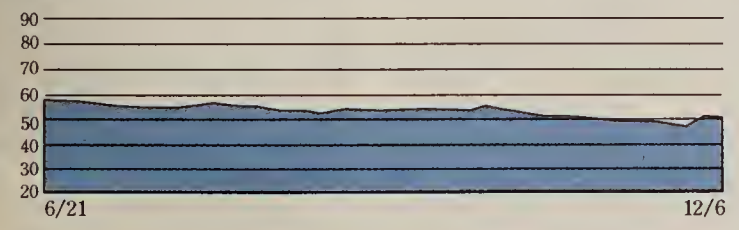
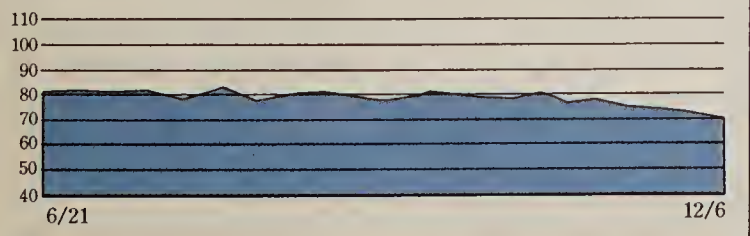


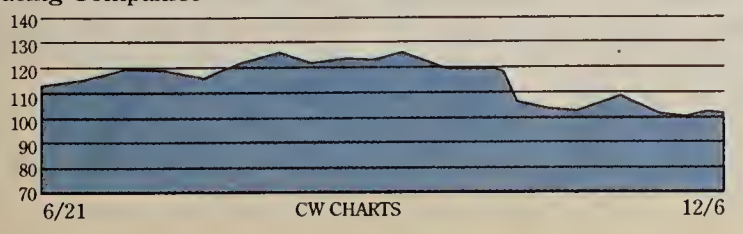
Semiconductors



Peripherals & Subsystems



Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DEC. 6, 1989

EXCH		52-WEEK RANGE		CLOSE DEC. 6, 1989	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	65	47	62.25	2.4	4.0
Q	ANOREW CORP	26	18	25.5	1.0	4.1
Q	ARTEL COMM CORP	9	2	7	0.9	14.3
N	AT&T	46	28	43.625	0.9	2.0
Q	AVANTEK INC	7	4	4	0.0	0.0
N	AYOIN CORP	21	14	17.25	0.1	0.7
N	8ELL ATLANTIC CORP	107	69	105.75	3.8	3.7
N	8ELLSOUTH CORP	55	39	53.75	1.4	2.6
Q	COMPRESSION LA8S INC	11	3	8.25	-0.1	-1.5
Q	CONTEL CORP	37	19	34.375	2.3	7.0
Q	OATA SWITCH CORP	6	2	3.375	-0.1	-3.6
Q	OIGITAL COMMUNICATIONS ASSOC	26	17	18.875	0.8	4.1
Q	OYNATECH CORP	21	16	17	0.3	1.5
Q	FIBRONICS INTNL INC	7	4	6.5	-0.3	-3.7
Q	GANOALF TECHNOLOGIES	7	4	5.25	-0.6	-10.6
N	GENERAL DATACOMM INOS	7	4	4.375	-0.1	-2.8
N	GTE CORP	70	43	68.5	1.5	2.2
Q	INFOTRON SYS CORP	13	8	8.5	0.0	0.0
N	ITT CORP	65	50	60.625	0.1	0.2
N	M A COM INC	9	5	5.125	-0.3	-4.7
Q	MCI COMMUNICATIONS CORP	49	22	43.25	-0.9	-2.0
N	NETWORK EQUIPMENT TECH INC	28	16	26.25	0.4	1.4
Q	NETWORK SYS CORP	11	7	7.75	-0.3	-3.1
N	NORTHERN TELECOM LTO	23	14	22.125	0.6	2.9
Q	NOVELL INC	38	24	28.25	2.8	10.8
N	NYNEX CORP	86	65	85.125	3.6	4.4
N	PACIFIC TELESIS GROUP	49	30	47.75	2.3	4.9
A	PENRIL CORP	9	3	7.125	-0.9	-10.9
N	PLESSEY PLC	46	37	40.625	1.3	3.3
N	SCIENTIFIC ATLANTA INC	25	12	24.5	0.3	1.0
N	SOUTHWESTERN 8ELL CORP	59	39	57.5	2.4	4.3
Q	3 COM CORP	29	10	13.375	0.5	3.9
N	U S WEST INC	75	57	73	2.5	3.5
	Computer Systems					
Q	ALLIANT COMPUTER SYS	7	3	5.75	0.3	4.5
Q	ALPHA MICROSYSTEMS	8	4	4.5	0.0	0.0
Q	ALTOS COMPUTER SYS	9	6	7.125	-0.4	-5.0
A	AMDAHL CORP	23	11	13.375	0.9	7.0
Q	APPLE COMPUTER INC	50	34	42.75	-1.3	-2.8
N	8OLT 8ERANEK & NEWMAN	13	6	6.5	-0.6	-8.8
N	COMPAQ COMPUTER CORP	113	56	89.25	-0.3	-0.3
N	COMMODORE INTNL	20	7	10	1.4	15.9
Q	COMPUTER AUTOMATION INC	7	2	2.375	0.4	18.8
N	CONTROL DATA CORP	24	17	17.625	1.0	6.0
N	CRAY RESH INC	66	31	38.125	4.6	13.8
Q	DAISY SYS CORP	7	0	0.563	0.0	0.0
N	DATA GEN CORP	20	13	12.75	-1.3	-8.9
N	DATAPOINT CORP	6	3	4.25	-0.3	-5.6
Q	OELL COMPUTER CORP	12	5	5.875	0.3	4.4
N	OIGITAL EQUIP CORP	122	84	86.75	1.0	1.2
N	FLOATING POINT SYS INC	4	1	1.5	-0.1	-7.7
N	HARRIS CORP	40	26	33.875	0.5	1.5
N	HEWLETT PACKARO CO	62	40	45.875	1.6	3.7
N	HONEYWELL INC	92	57	82	2.6	3.3
N	IBM	131	96	98.625	0.9	0.9
Q	INFORMATION INTL INC	16	12	12.25	-0.3	-2.0
Q	IPL SYS INC	9	4	6.875	0.1	1.9
N	MAI 8ASIC FOUR INC	11	3	3.375	0.0	0.0
N	MATSUSHITA ELEC INOL LTO	204	154	162.75	2.8	1.7
Q	MENTOR GRAPHICS CORP	22	13	17.375	0.6	3.7
N	N8I INC	3	0	0.5	-0.1	-20.0
N	NCR CORP	67	53	61.375	0.1	0.2
N	PRIME COMPUTER INC	21	6	6.625	-0.4	-5.4
Q	PYRAMID TECHNOLOGY	20	9	17.5	1.0	6.1
Q	SEQUENT COMPUTER SYS INC	21	9	20	0.5	2.6
Q	SHARE8ASE CORP	4	0	0.25	0.0	0.0
Q	SILICON GRAPHICS CORP	27	14	25.5	0.5	2.0
Q	STRATUS COMPUTER	35	21	21.625	0.0	0.0
Q	SUN MICROSYSTEM INC	23	13	16.625	0.5	3.1
Q	SYM80LICS INC	3	1	1.563	0.1	4.2
N	TANOEM COMPUTERS INC	26	15	23.125	0.4	1.6
N	TANOY CORP	49	38	41.375	-1.6	-3.8
N	ULTIMATE CORP	12	7	9.75	0.5	5.4
N	UNISYS CORP	31	12	14.25	-0.1	-0.9
A	WANG LA8S INC	11	5	5.25	0.0	0.0
	Software & DP Services					
Q	ADO8E SYS INC	30	14	19.75	-0.3	-1.3
Q	AMERICAN MANAGEMENT SYS INC	19	11	13	-0.1	-1.0
Q	AMERICAN SOFTWARE INC	23	10	21.625	-0.4	-1.7
N	ANACOMP INC	9	4	4.5	0.1	2.9
Q	ANALYSTS INTERNATIONAL CORP	20	8	17.75	0.4	2.2
Q	ASHTON TATE	24	9	10.75	-0.3	-2.3
Q	ASK COMPUTER SYS INC	18	7	9	0.4	4.3
N	AUTO DATA PROCESSING	51	36	47.5	-1.0	-2.1
Q	AUTOOESK INC	44	26	36	0.8	2.1
Q	8MC SOFTWARE INC	30	12	27.625	-1.1	-3.9
N	8USINESSLANO INC	15	9	9.5	-0.4	-3.8
Q	COGNOS INC	9	4	4.75	0.6	15.2
N	COMPUTER ASSOCIATES INTL INC	22	11	12.75	0.4	3.0
Q	COMPUTER HORIZONS CORP	11	7	8.5	-0.1	-0.7
N	COMPUTER SCIENCES CORP	57	46	55.25	-0.8	-1.3
N	COMPUTER TASK GROUP INC	16	10	10.25	-1.0	-8.9
Q	COMSHARE INC	42	20	35.625	-0.9	-2.4
Q	CORPORATE SOFTWARE	16	9	10.125	0.4	3.8
N	GENERAL MTRS (CLS E)	58	41	54.875	0.0	0.0
Q	HOGAN SYS INC	7	4	5	0.1	2.6
Q	INFORMIX CORP	15	8	13.875	0.1	0.9
Q	INTELLICORP INC	6	3	4.75	0.0	0.0
Q	LEGENT CORP	32	20	27.5	1.3	4.8
Q	LOTUS DEV CORP	34	18	29.75	0.8	2.6
Q	MANAGEMENT SCI AMER	18	7	18.25	0.3	1.4
Q	MICROSOFT CORP	89	46	85.25	-0.3	-0.3
Q	NATIONAL OATA CORP	35	22	34	1.3	3.8
N	ON LINE SOFTWARE INTL INC	9	5	9	0.6	7.5
Q	ORACLE SYS CORP	26	9	24.5	0.8	3.2
N	PANSOPHIC SYS INC	18	12	16.25	0.6	4.0
Q	PHOENIX TECHNOLOGIES INC	19	3	4.625	0.0	0.0
Q	POLICY MANAGEMENT SYS CORP	38	22	35.75	-0.3	-0.7
Q	PROGRAMMING & SYS INC	22	16	21.5	0.3	1.2
Q	RELATIONAL TECH INC	16	5	6.75	0.9	14.9
N	REYNOLDS & REYNOLDS CO	34	23	27	1.6	6.4
Q	SAGE SOFTWARE INC	11	7	9.5	-0.1	-1.3
Q	SEI CORP	20	16	18.125	-0.3	-1.4
Q	SHAREO ME O SYS CORP	19	12	13.125	0.5	4.0
Q	SOFTWARE PUBG CORP	21	10	16.75	1.3	8.1
A	STERLING SOFTWARE INC	9	5	9	0.5	5.9
Q	SUNGARO DATA SYS INC	24	13	23.5	1.8	8.0
Q	SYSTEMATICS INC	40	30	35.25	0.3	0.7
N	SYSTEM CENTER INC	26	17	19	0.5	2.7
N	SYS. SOFT INC	30	16	27.5	-0.3	-0.9
Q	WOROSTAR	3	2	1.688	0.0	0.0
	Semiconductors					
N	AOV MICRO OEVICES INC	11	7	7.5	0.0	0.0
N	ANALOG OEVICES INC	13	8	8.875	0.3	2.9
Q	ANALOGIC CORP	11	8	9.625	0.1	1.3
Q	CHIPS & TECHNOLOGIES INC	26	11	17.5	-0.8	-4.1
Q	INTEL CORP	36	21	34.75	0.0	0.0
Q	MICRON TECHNOLOGY INC	26	10	9.75	-0.4	-3.7
N	MOTOROLA INC	63	40	59	0.0	0.0
N	NATL SEMICONOUCTOR	10	6	7.25	0.3	3.6
N	TEXAS INSTRS INC	47	28	36.125	0.1	0.3
A	WESTERN OIGITAL CORP	15	6	8	-0.3	-3.0
	Peripherals					
Q	ALLOY COMP	3	1	1.375	-0.1	-8.3
N	AM INTL INC	6	4	4.375	-0.8	-14.6
Q	AST RESH INC	11	7	10.625	-0.3	-2.3
Q	AUTO TROL TECH CORP	6	4	3.875	0.0	0.0
Q	8ANCTEC INC	20	10	14.625	-0.5	-3.3
Q	CIPHER OATA PRO OS INC	11	4	4.5	-0.1	-2.7
A	COGNITRONICS CORP	8	2	6.125	0.3	4.3
Q	CONNOR PERIPHERALS	16	7	12.5	0.3	2.0
A	OATAPROOUCTS CORP	18	8	8	-0.4	-4.5
A	OATARAM CORP	12	7	9.5	-0.3	-2.6
N	EASTMAN KODAK CO	52	41	43	1.3	3.0
N	E M C CORP MASS	6	3	3.75	-0.3	-6.3
Q	EMULEX CORP	12	5	6.125	-0.5	-7.5
Q	EVANS & SUTHERLANO	25	15	23.5	-0.3	-1.1
Q	ICOT CORP	3	1	1.5	0.1	9.1
Q	INTERLEAF INC	10	5	6.125	0.0	0.0
Q	IOMEGA CORP	5	2	3.188	-0.1	-3.8
Q	LEE DATA CORP	4	1	1.5	-0.1	-7.7
Q	MASSTOR SYS CORP	4	2	2.313	0.1	2.8
Q	MAXTOR CORP	12	7	9.5	0.0	0.0
Q	MICROPOLIS CORP	9	3	3.625	0.0	0.0
Q	MINISCRI8E CORP	9	0	0.625	-0.3	-28.6
N	MINNESOTA MNG & MFG CO	80	60	79.125	3.0	3.9
Q	PERSONAL COMP PROOUCTS INC	6	4	4.125	-0.3	-5.7
Q	PRIAM CORP	2	0	0.094	0.1	49.2
Q	PRINTRONIX INC	10	7	9.875	0.1	1.3
N	QMS INC	12	7	11	0.4	3.5
Q	QUANTUM CORP	17	4	10.625	0.0	0.0
N	RECOGNITION EQUIP INC	13	6	7.375	0.3	3.5
Q	REXON INC	8	6	5.75	-0.4	-6.1
Q	SEAGATE TECHNOLOGY	16	7	14.375	0.5	3.6
N	STORAGE TECH CORP	23	9	13.375	0.1	0.9
Q	TANDON CORP	1	0	0.75	-0.1	-7.7
N	TEKTRONIX INC	24	16	17	0.3	1.5
Q	TELEVIOEO SYS INC	1	0	0.25	-0.1	-20.1
N	XEROX CORP	69	56	59.625	2.4	4.1

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

Right stuff

Cray stock swells after a wave of positive analyst reviews

Sometimes convincing the right people that you are on the right track is enough to attract investors. Cray Research, Inc. got a positive recommendation from analysts two weeks ago and an order for an X-MP 8/864 supercomputer last week; the firm finished Thursday at 38¼, up 4¾ points.

Apple Computer, Inc's. stock, on the other hand, was bruised by analysts, who lowered their earnings estimates for the first quarter. The company's high-priced Macintosh is selling well, but analysts said the firm is concerned about demand for its low-end products. Apple dropped 1¼ points to close at 42¾.

Commodore International Ltd. jumped 1⅝ points to close at 10⅜. Novell, Inc. also made a strong showing, closing at 29¾, a gain of 2⅜ points. Digital Equipment Corp., which detailed some of its plans to redeploy up to 15,000 of its workers during the next three years, climbed 1⅛ points to close at 86⅛. IBM's announcement of cost-cutting measures (see story page 1) brought trading in its shares to a standstill midweek. The eventual effect, however, was positive: IBM inched up ⅞ of a point to finish at 98.

MCI Communications Corp. and AT&T announced plans to link their electronic mail networks; MCI closed at 43⅞, off 1 point, while AT&T finished at 43¾, down ⅝ of a point.

JOSEPH J. FATTON

Hackers

FROM PAGE 1

other crimes — are "obsessed with data and voice networks," asked Gail Thackery, Arizona state assistant district attorney.

The phreaks use voice-mail systems as electronic street corners to exchange such information as stolen credit-card numbers and long-distance telephone access codes. They target PBXs — especially those that allow access to international telephone lines — to make telephone calls that are ultimately billed to the PBX owner.

The phreaks are not merely the stereotypical youthful hackers who steal telephone service or break into corporate computer systems for kicks, law enforcement officials said. Frequently, they use PBX and voice-mail systems to facilitate the carrying out of more traditional crimes, according to Jim Black, coordinator of the computer-crime unit in the fraud section of the Los Angeles Police Department (LAPD). The LAPD computer-crime unit is one of only a handful of such units operated by police agencies in the country.

"Looking at the telephone bills of compromised PBX systems, we see that most of the calls are being made to Colombia and other Latin American countries or the Middle East and are related to drug deals," Black said.

A couple of years ago, one phreak racked up calls amounting to $100,000 while operating a telephone service on a PBX installed at William L. Seay & Associates, an employee benefits administration company in Los Angeles. The phreak exploited a glitch in the company's PBX system that allowed him to access long-distance service. Once inside the system, he placed calls for his "clients" and billed them for the service.

"We discovered the problem within the first month, mainly because we had a lot of telephone calls to Pakistan, and we knew that no one here needed to call there," explained Sean Dugan, an assistant manager at the firm. The phreak, a Pakistani who was arrested and deported, was able to break into the PBX repeatedly for more than a year while the case was being investigated.

The issue of who should pay the $100,000 bill led to a dispute between the firm and the long-distance carrier that at one point was sent to a collection agency before the carrier finally agreed to absorb the charges. "It was a real mess," Dugan said.

Calculating the cost of telephone theft by these high-tech street gangs may be impossible because the victims seldom come forth. "I have heard figures that range between $500 million and $5 billion per year . . . it may be even higher," said William Cook, U.S. assistant district attorney for the Northern District of Illinois.

For most of this year, Cook has been heading an investigation into a nationwide ring of some 150 hackers who are suspected of stealing $1.6 million worth of telephone services as well as trafficking in stolen credit-card numbers and telephone access codes [CW, June 5] . The gang's ringleader has been arrested and is awaiting trial, and four other members of the gang have entered guilty pleas in courtrooms in four states.

Victims of voice-mail and PBX fraud — both corporate owners of these systems and telecommunications carriers — are seldom willing to prosecute out of fear that the publicity will prompt other phreaks to attack their systems. They also fret that the publicity could be bad for business. One "very large East Coast business lost $1 million in only a few days" but decided to absorb the loss rather than prosecute, according to Black.

"I can pick up the phone any time of the day, call a voice-mail system and get into a box that has been compromised and get stolen credit-card numbers, long-distance telephone access numbers and other information, but unless the victim cooperates, I can't investigate," Black said.

Furthermore, some telephone carriers are reluctant to assist in prosecutions out of fear of violating the Electronic Communications Privacy Act (ECPA) of 1986, which prohibits them from monitoring the conversations on their telephone lines.

In a situation that could be taken from the pages of *Catch-22*, the victim could theoretically be sued for invasion of privacy by the hacker.

"Regardless of the individual being attacked or the hacker doing it, they are both our customers, and we have the responsibility of protecting them equally," said Bill Bourke, manager of risk management security at Bell Atlantic.

"The bad guy gets rights, and the telephone company gets sued," a frustrated Thackery said. "There is no clear statement that says that if the system is under attack, the owner must have [the] right under limited circumstances to eavesdrop in order to protect that system. In the day of the virus and worm, we cannot say anything else."

The long-distance carriers, U.S. Sprint Communications Co. and MCI Communications Corp., in particular, are outstanding examples of cooperation, but the local telephone companies are stubborn as an overly burdened mule, according to Thackery.

Phreak attacks

When phreaks sneak into a company's private branch exchange (PBX) system, they are mainly out to crack the password to an "extender code" that will allow them to route their telephone calls through the PBX onto long-distance telephone lines.

Unlike a telephone credit-card holder, the PBX owner is liable for the long-distance calls that the phreaks make using the system.

"Some companies don't suspect that there is a problem until they get a telephone bill that is delivered to them in boxes by UPS instead of an envelope," said William Cook, U.S. assistant district attorney for the northern district of Illinois.

The billing cycle for PBX systems is typically a month, so the unauthorized use of the system can go on for several days before it is detected. Meanwhile, losses can mount rapidly, often exceeding $10,000 per day.

"The PBX fad is the absolutely worst problem right now because telephone carriers, especially the long-distance carriers, have increased security and their ability to catch people so much that the phreaks are going after PBXs instead," said Gail Thackery, Arizona state assistant district attorney.

PBX systems are also attractive to phreaks because tracing a telephone call that is routed through a PBX is often difficult and time-consuming.

Voice-mail systems are under attack because they allow phreaks to easily exchange illegally-obtained access codes and credit-card numbers with impunity because the calls are difficult to trace.

Law enforcement officials complain that companies that use voice-mail systems often install them without an adequate understanding of their security. The systems are too easy to break into because the passwords are easy to decipher or because default passwords have been left intact. Often, the system is administered by a person who does not understand that a voice-mail system is in fact a computer system and should be made as secure as a computer used for accounting and billing.

"They have a brand-new system but don't understand the risks or vulnerabilities," said David Wexler, information systems security manager at Bell Atlantic Corp. "The risks are similar for voice mail, PBX, an operations system for manufacturing or a mainframe for billing. They are not less secure and can be made as secure as any other computer."

He suggested that the voice-mail system administration and security be turned over to IS professionals who are trained in aspects of computer security.

MICHAEL ALEXANDER

Sexy Service

BERN, Switzerland — Swiss hackers recently obtained a videotex terminal password list of the Swiss Banking Association, Schweizerbankverein (SBV), and ran up between one million Swiss francs ($625,000) and two million francs ($1.25 million) in charges to SBV for using it.

The hackers allegedly programmed the SBV's videotex software-equipped personal computers so that expensive videotex pages of the databank "Iris" were called up over several days at the expense of SBV password holders.

Known for its erotic direct-dialogue service, "Iris" is run by Lausanne, Switzerland-based Vtx-Service SA. In addition, the service offers horoscopes for 30 francs ($19) per order.

According to Swiss videotex vendor association Svipa, "We are dealing with an isolated case."

According to Vtx-Service, the SBV has 35 subscriber terminals. It is not certain for which machines the alleged hackers obtained passwords. One unidentified hacker has reportedly been caught.

COMPUTERWORLD SCHWEIZ

Logica derails from BART contract

BY J. A. SAVAGE
CW STAFF

After a rancorous month between software contractor Logica Data Architects, Inc. and the Bay Area Rapid Transit (BART) system authorities, Logica walked out on the contract last week, while its software project lay close to being finished.

Logica made a final offer to the BART board to complete the software for a fixed price of $1.1 million. Logica has already received over $18 million to write the package intended to manage BART's trains. It runs on a Data General Corp. minicomputer.

The BART board hired auditors to review the work. In late November, auditor LS Transit Systems, Inc. said there were major — but not fatal — flaws in the software. Financial auditor Peat Marwick Main & Co. said there were $2.67 million in excess costs for the contract.

At that time the BART board decided essentially to "pocket-veto" any continuing work by Logica by taking no action and letting the contract expire. Logica wrote to the board with its final offer on Nov. 30. Since the board did not respond by Friday of last week, Logica's staff walked out.

Don't do it yourself

"If they choose to finish it [in house], it will cost twice as much," predicted Norman Zachary, Logica's president.

"The board's decision will be to cost Bay Area taxpayers significantly more money while creating the very real possibility that the project may never be complete," Zachary said in a prepared statement. "If you take the final testing aspects and take away the heart of the team that did the development, either the system will act superb, and it will have no problems, or you'll get a bunch of people in there who don't know what's going on with software."

Logica also noted that it was leaving the project without having documented the software to allow maintenance.

LS Transit told the BART board that completion of the project in-house would take at least another year and cost about $1.8 million. Logica began the job in 1986.

Zachary maintained that the type of contract issued by BART precluded the financial auditor's findings and that the company delivered the package required in the contract.

"If there is any damage to our reputation, we'll deal with it," Zachary said .

Apollo users given HP migration path for Prism

BY MARYFRAN JOHNSON
CW STAFF

Apollo computer users expressed guarded optimism last week at the prospect of Hewlett-Packard Co. and its Apollo division merging their two hardware platforms into one "hybrid" system based on HP's Precision Architecture (PA) by 1992.

Yet, while some customers were willing to grit their teeth and hang on, others were heading toward other vendors — impatient at the six-month wait between the merger and the revelation of future product direction.

Company officials last week sketched out plans for a second generation of the HP PA and Apollo Prism workstations to be introduced next year and for merging them in a third generation. Those plans were replete with promises to preserve the best parts of Prism and PA and to painlessly integrate the two reduced instruction set computing-based lines into the same product stream.

The marriage of the two product lines will prove that "HP is not going to trash the Apollo hardware," said Jim Hammons, manager of the technology advisory service for Sierra Group, Inc. in Tempe, Ariz.

Both companies' workstation lines will continue through 1991, with second-generation enhancements available late next year to expand processor power, compilers, main memory and disk capacity.

The HP and Apollo systems based on Motorola, Inc.'s 68000 chip family will also continue into the mid-1990s.

Users will be offered the opportunity to recompile their applications from Prism to the HP systems — a step that becomes mandatory once the Prism and PA architectures "collapse" into one third-generation line by 1992, according to company officials.

Most users seemed confident that HP could deliver on its promise to migrate their applications from the Prism to the PA systems through recompiling technology.

"Apollo has some of the most advanced compiler technology in the industry now," said Fred Mervine, a computer scientist at Parc Place Systems, a software developer in Mountain View, Calif.

If HP does indeed pick out the best from both systems for the third-generation products, users and analysts said Prism would contribute parallel or multiprocessing capabilities plus superior recompiler and graphics technology. Mervine said he believed Apollo innovations, particularly in networking, would eventually "permeate the product line" at HP.

Yet, with the Apollo product line essentially disappearing within three years, why would customers want to buy another Prism box?

"They'll get better price/performance out of them," said Robert Cameron, an industry analyst at the Boxboro, Mass., office of Dataquest, Inc.

Several users emphasized the importance of HP retaining the Domain operating system and network on Apollo machines.

"We want them to understand that Domain is the crown jewel of Apollo," said Doug Eltoft, director of the Iowa Computer-Aided Engineering Network at the University of Iowa. "Domain is why there are so many Apollo loyalists out there."

At the University of Washington in Seattle, Assistant Professor Brad Holt said he would withhold his optimism until he saw some new products for his Apollo network.

"It's fine to talk about it, but you have to really see what it boils down to," Holt said.

The appearance of ongoing product support from HP is critical to Apollo customers. Users contacted after the announcement said HP's wavering stand on supporting Apollo products or integrating them into a long-range strategy has cost the company systems sales.

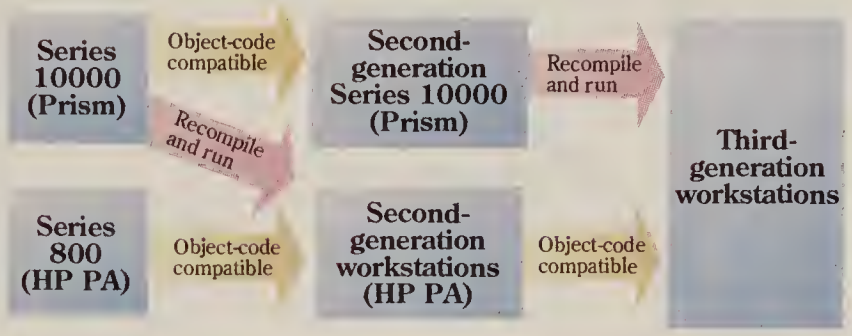
"We went with DEC, but things certainly could have been different if HP and Apollo's feet were on the ground last spring," said Kevin Sculley, systems analyst at Sumitomo Bank Capital Markets in New York. "All we got from HP were mixed signals over whether they would support the Apollo products, which we were interested in. So we passed over them."

At Gateway/Cadence Design Automation in Lowell, Mass., the company chose Sun Microsystems, Inc.'s Scalable Processor Architecture stations over Apollo workstations recently because the Sun stations were cheaper and ready to ship, software engineer Rene Churchill said.

Boston-based free-lance writer William Brandel contributed to this report.

Two-step shuffle

Hewlett-Packard sketched out a two-step migration path to merge its own workstation line with the one it acquired from Apollo



SOURCE: HEWLETT-PACKARD CO. CW CHART: JOHN YORK

Latest HP chip to plug high-end need

BY J. A. SAVAGE
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. last week unveiled a reduced instruction set computing (RISC) chip that some customers said will provide a much-needed performance boost for high-end systems next year.

The technology, according to HP, will double the current power capacity and nearly doubles the rate of transactions per second of the company's current RISC chips.

Likely to appear in many products late next year, the RISC processor will be used first in a high-end minicomputer and will most likely be available as a board upgrade, according to Willem Roelandts, general manager of HP's Computer Systems Group. Other versions will also be utilized throughout the HP product line.

Users approaching the performance limits of current systems welcomed the new technology.

"The more horsepower we can get, the better," said David Rimer, manager of computer operations and technical support at Choicecare in Cincinnati. Rimer said his current Model 950, which is nearly the top of the line, is causing "real performance problems with users" who depend on on-line access. Rimer is upgrading as fast as he can and appreciates HP's commitment to board swaps rather than an investment in a whole new box. "It's easier on the customer," he said.

John Robinson, director of corporate information systems at Cox Enterprises, Inc. in Atlanta, said a doubling of HP's current high-end power would make the difference between buying another HP computer or one from another vendor for some new applications. "A more powerful processor makes us more confident," Robinson said.

A new high-end CPU should run between 50 million and 60 million instructions per second with a clock speed of 48 MHz, according to Denny Georg, research and development manager for the project.

HP is also working on another RISC architecture that is called "superscalar," according to Roelandts. The superscalar architecture would allow parallel processing and execution of multiple instruction sets per cycle, he said.

Observers said the new chip technology bodes well for HP at a time when computer companies are scraping for profits.

At a financial analysts meeting last week, analysts in attendance predicted HP would remain a stable company next year.

Citing coming cuts in defense spending and a slowdown in the manufacturing sector, however, John Young, HP's chief executive officer, was cautious in setting financial expectations.

"People like their style," said Joe Payne, an analyst at Alex Brown & Sons, Inc. in Baltimore. Payne said he believed HP was behind in some technologies such as on-line transaction processing.

Also confident in HP's future was analyst David Wu at S. G. Warburg & Co., Inc. in New York. "If they didn't get killed in the systems business this year, there's no reason to get killed next year," Wu said.

Netware hits the big 80386

BY JOANIE M. WEXLER
CW STAFF

BOSTON — Novell, Inc. announced last week that it has extended its Netware SQL relational database services to the 32-bit Intel Corp. 80386 computing platform and has enhanced its XQL application program interface.

Netware SQL, a server-based product, and XQL, a client-based offering, are development tools that interface between programming languages to the lower level Btrieve record manager.

Novell, at last week's Database World Exposition, said Netware SQL 386 is a relational database engine that integrates with the Netware operating system to provide back-end database services for front-end applications on client workstations.

"The SQL product from Novell has traditionally been a development tool for Netware developers," said analyst Lee Doyle at International Data Corp. in Framingham, Mass. "Having that tool available for Netware 386 will help those applications get ported over to the 386 platform."

Also at the exposition, Novell announced an "embedded SQL" enhancement for XQL that could speed up the programming process by enabling developers to combine two steps into one. The feature allows the developer to incorporate standard ANSI/ISO SQL syntax while writing C language source code instead of adding the syntax afterward.

The company also said that embedded SQL, which is licensed from Watcom Products, Inc. is modeled after the IBM Systems Application Architecture SQL standard.

Novell also announced Version 5.10 of its Btrieve record management system that allows key-oriented searches.

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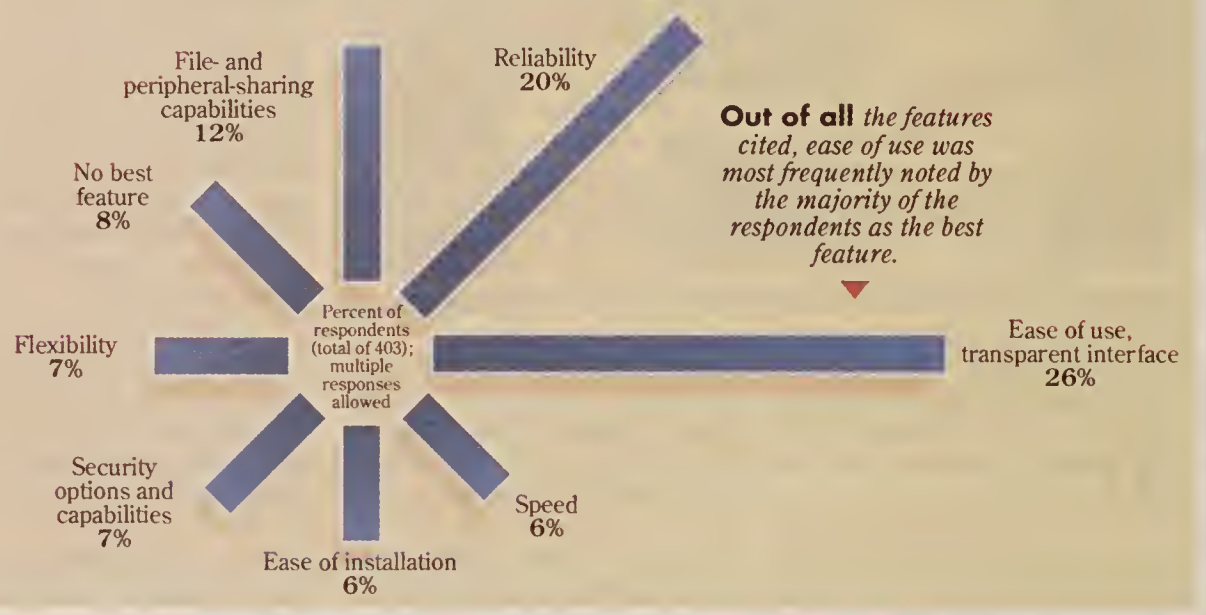
TRENDS

LAN OPERATING SYSTEMS

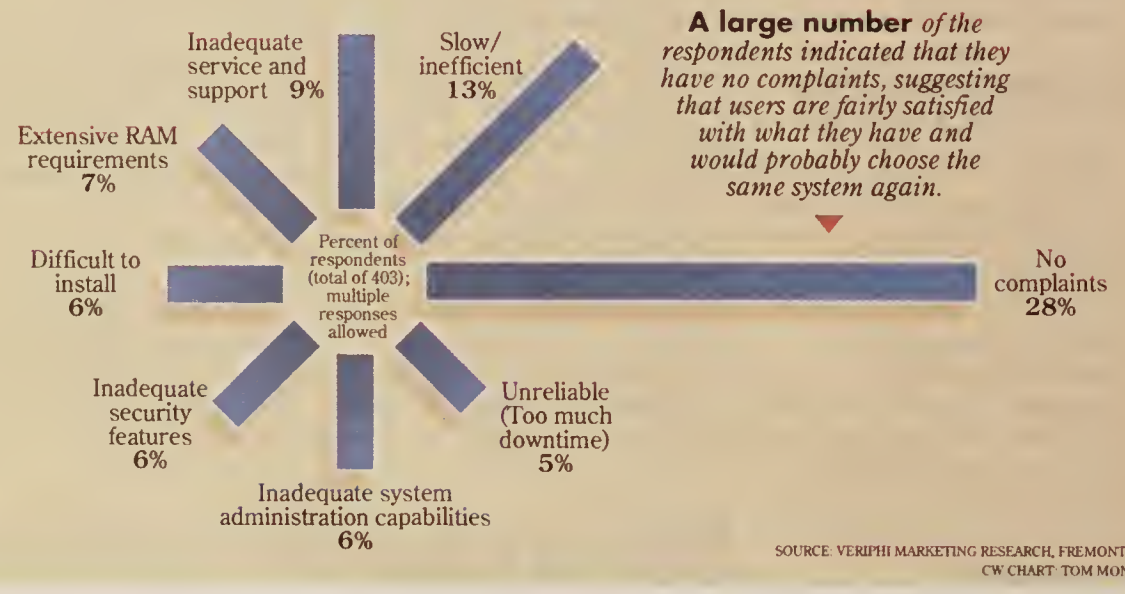
Veriphi Marketing Research surveyed 403 users of various LAN operating systems about their primary PC LAN operating system.

(Only the top eight responses are listed; therefore, percentages do not add total 100)

What do you consider to be the best feature of your LAN operating system?



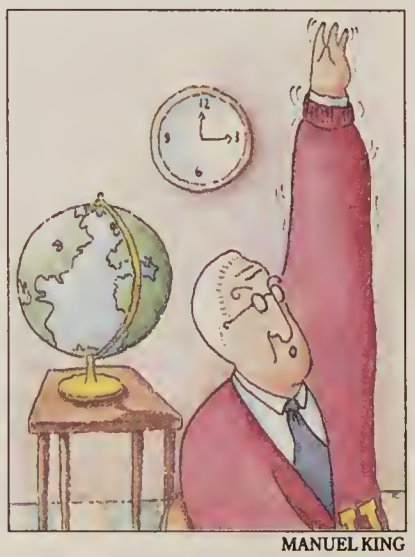
What is your biggest complaint?



SOURCE: VERIPHI MARKETING RESEARCH, FREMONT, CALIF.
CW CHART: TOM MONAHAN

NEXT WEEK

What would a full-grown IS executive be doing in a classroom? Learning about business, that's what. Many business schools, professional groups and consulting firms now offer programs specially designed for senior IS managers. Manager's Journal reports that while some go strictly by the book, others use more adventurous methods.



MANUEL KING

The 1980s was a volatile, exciting, puzzling, breakthrough decade in the information industry. It was a decade of people and machines, synergy and explosion, as well as a time for the computer to move out of the glass-enclosed data center and into the hands of the people. In Depth takes a look back at the decade in a timeline of key events.

INSIDE LINES

Two is less than one under the Sun

Sun Microsystems should have the low-end Sparcstation 2 ready to go by springtime. The price: "well under $5,000," one Sun official said. Additionally, Stardent insiders said it will provide a graphics-intensive machine that hovers around $20,000 by early next year. Most Stardent models are about four to five times that amount.

Some Suns to go nova?

Sun may deny the near-term fadeout of its Intel- and Motorola-based product lines, but it sure looks like the handwriting is on the wall. Sun President Scott McNealy said that Sparc machines now account for 90% of its shipments, and he hopes to cut the firm's product development costs significantly by July 1. "We're getting all our wood behind one arrowhead," he said during Technologic Partners' computer conference.

We do things our way in Texas

Don't look for any RISC-based machines from Compaq in the near future. Chief Rod Canion said it's just not worth the headache and compatibility problems.

Bean-counting horsepower

Big Eight auditing firm Coopers & Lybrand is standardizing on Intel 80386-based machines for its installed base of 1,000 PCs. About two-thirds of them are currently non-386 units, but the firm hopes to upgrade all of them in 1990, primarily on Compaq and Toshiba personal computers. "It's gotten to the point where people have to justify the purchase if they *don't* want a 386," said Stephen Rood, head of PC technology. Coopers is developing proprietary applications for its auditors that need 386 power for optimum performance, Rood said.

Only baked beans go over around Boston

Index Group, an IS consulting firm in Cambridge, Mass., snagged a big fish from one of its archrivals last week as James P. Ware, a principal at Nolan, Norton in Lexington, Mass., joined Index as a vice-president. Word in the consulting world is that several consultants at Nolan, Norton have become less than enamored of the situation there since Nolan, Norton's 1987 acquisition by KPMG Peat Marwick.

Can someone put it out of its misery?

Northern Telecom is, not too surprisingly, delaying the unveiling of a successor to its ill-fated Meridian Data Networking System. After vainly seeking a market for its everything-but-the-kitchen-sink networking platform, Northern quietly pulled the plug last September, promising to announce comparable functionality based on a more standardized computing architecture within 90 days. That would be now, but the latest word from Northern is, "Don't look for anything before the first of next year."

Stacking up net protocols

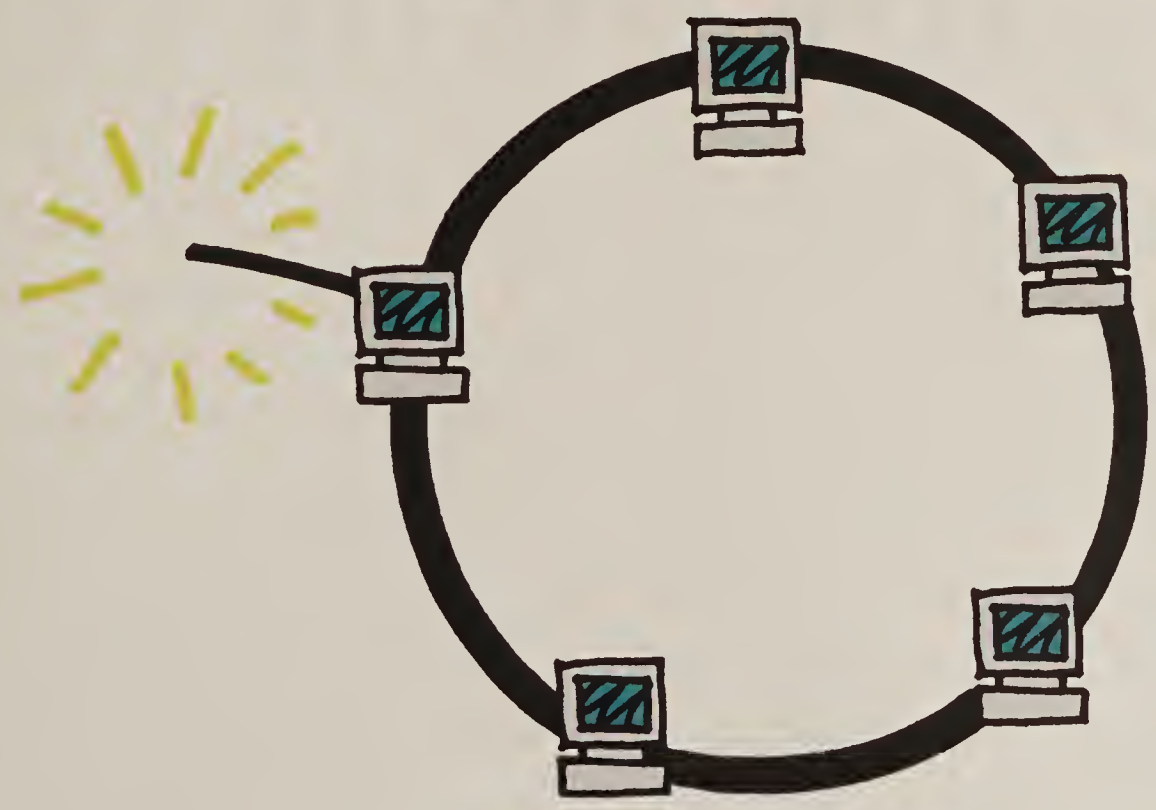
With functional OSI network management still about a year off, even IBM is apparently feeling pressure to support SNMP, a network management standard based on Transmission Control Protocol/Internet Protocol, which has the advantage of being here now. A consultant reports recently seeing "a slide in Raleigh, depicting Netview on top of [OSI protocol] CMIP, SNMP," as well as Systems Network Architecture.

There are ways to make things happen

Historical layoff ban or not, IBM is nevertheless quietly cranking up the rate at which it fires employees, according to Prudential-Bache Research analyst Rick Martin. "Of course, to be fair, you should note that the traditional rate has been just about zero," he added. In addition, the company is starting a new tradition: employee ranking by skill group.

Let's see: if IBM's layoffs — oops — I mean, accelerated attrition, produces 50 cents per share of profit next year, with some 10,000 employees involved, that works out to about 0.005 cents per employee per share. How would you like to go home and tell the kids that your glorious career came to a close in exchange for 5-thousandths of a penny? If anyone knows where this is all leading, call the hotline at 800-343-6474 and pass on the skinny to News Editor Pete Bartolik.

The Wrong Token Ring Network Can Have A Big Impact On Your Business.



If you're not careful, the Token Ring network that seems oh-so-right can become oh-so-wrong oh-so-fast.

So we suggest you buy a LAN built around a Western Digital TokenCard.™ We're dedicated to preserving your sanity as well as your investment. That's why the products we build tomorrow are guaranteed to be compatible with the ones we build today.

But let's get another thing straight before we go any further—our Token Ring products are also IBM compatible. Not semi-compatible, quasi-compatible, or any other prefix-compatible. They're compatible. Period.

Contrary to all the hype, hyperbole, and hooey you may read in other LAN ads, our Token Ring LANs may well be the fastest money can buy. So fast that your throughput will increase dramatically. Your people will become more productive. And you'll be named Leader of the Year by several major business publications.

THE LAN FORMS HERE

The last sentence fragment is, perhaps, a slight exaggeration. But the two previous ones are absolutely true. Just checking to see if you're actually reading this stuff.

Naturally, all Western Digital Token Ring and Ethernet products are compatible with Novell NetWare and really hum in all IBM environments.

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Our Token Ring products are available now. Today. With no delays. No excuses. No kidding.

In fact, the only thing keeping you from getting your Token Ring up and running is the fact that you're still reading this ad.

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20